U. S. Government

RESEARCH REPORTS

April 20, 1962
Vol. 37 No. 8

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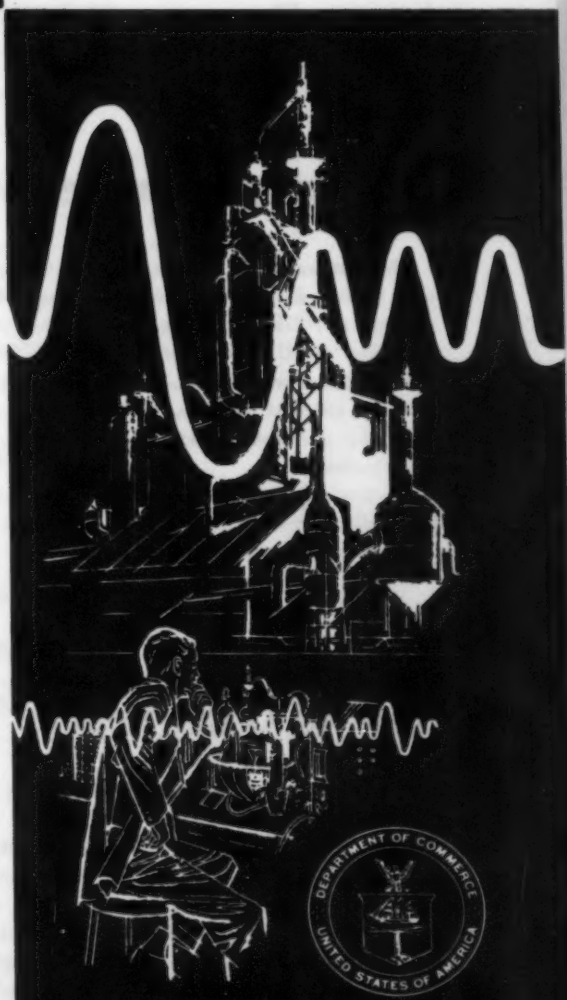

U. S. DEPARTMENT OF COMMERCE
BUSINESS AND DEFENSE SERVICES ADMINISTRATION
Office of Technical Services

U.S. GOVERNMENT RESEARCH REPORTS

U.S. DEPARTMENT OF COMMERCE
Luther H. Hodges, *Secretary*

BUSINESS AND DEFENSE SERVICES ADMINISTRATION
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Use of funds for printing this publication approved by the Director of the Bureau of the Budget, June 30, 1961.

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DESCRIPTOR INDEX

*ABLATION

AD-271 112 62-2-2 DIV. 12
NAVAL ORDNANCE LAB., WHITE OAK, MD.
DESCRIPTORS: (HIGH TEMPERATURE RESEARCH, TEST EQUIPMENT, TEST METHODS, *THERMAL INSULATION, HEAT, *INSULATING MATERIALS, HEAT RESISTANT POLYMERS, REFRACTORY MATERIALS, *ABLATION, *GUIDED MISSILES, *RE-ENTRY VEHICLES, *ROCKET CASES, *ROCKET MOTOR NOZZLES.) (MEASUREMENT, TEMPERATURE, THERMAL DIFFUSION, MATHEMATICAL ANALYSIS.) (OXYGEN, ACETYLENES, WELDING, FLAMES.)

*ABSORPTION

AD-271 098 62-2-2 DIV. 25
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*LIGHT, *ABSORPTION, WATER, DETERMINATION, INSTRUMENTATION, MEASUREMENT, OCEANS, LAKES.) (RECORDING DEVICES, DATA PROCESSING SYSTEMS.) (PHOTOTUBES, INSTRUMENTATION.) (UNDERWATER PHOTOGRAPHY, UNDERWATER TELEVISION SYSTEMS.) PHOTOELECTRIC TRANSDUCERS.

*ACCELERATION

AD-271 613 62-2-2 DIV. 1
GENERAL DYNAMICS/FORT WORTH, TEX.
DESCRIPTORS: (*ACCELERATION, GRAVITY, THRUST, BODY, ANTHROPOMETRY, AVIATION PERSONNEL.) (AVIATION SAFETY, *BAILOUT, *EJECTION SEAT, DESIGN, TEST METHODS, SAFETY HARNESS, COCKPITS, CATAPULTS.)

*ACCELERATORS

AD-271 510 62-2-2 DIV. 27
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON, D. C.
DESCRIPTORS: (MOLYBDENUM, WIRE SCREENS, *ION ACCELERATORS, ELECTRON BOMBARDMENT, MERCURY, ION BEAMS FOR *ION ROCKETS, ELECTRIC PROPULSION, TESTS.)

*ACCELEROMETERS

AD-271 418 62-2-2 DIV. 1
GENERAL ELECTRIC CO., BURLINGTON, VT.
DESCRIPTORS: (FLUID FLOW, *ACCELEROMETERS, GLASS, SPHERES, PELLETS, SURFACE PROPERTIES, MATHEMATICAL ANALYSIS, LOADING, CONFIGURATION, THEORY.)

AD-271 420 62-2-2 DIV. 1
GENERAL ELECTRIC CO., BURLINGTON, VT.
DESCRIPTORS: (FLUID FLOW, *ACCELEROMETERS, GLASS, SPHERES, PELLETS, SURFACE PROPERTIES, MATHEMATICAL ANALYSIS, LOADING, CONFIGURATION, TESTS, TEST METHODS, THEORY.)

*ACHIEVEMENT TESTS

AD-271 386 62-2-2 DIV. 28
EDUCATIONAL TESTING SERVICE, PRINCETON, N. J.
DESCRIPTORS: (*APTITUDE TESTS, *ACHIEVEMENT TESTS, STATISTICAL ANALYSIS, RELIABILITY, ANALYSIS OF VARIANCE.)

*ACOUSTIC FILTERS

AD-271 410 62-2-2 DIV. 8
DEFENSE RESEARCH LAB., U. OF TEXAS, AUSTIN.
DESCRIPTORS: (*ACOUSTIC FILTERS, *ACOUSTIC IMPEDANCE, FLUIDS.) (MEASUREMENT, WAVE TRANSMISSION, WATER, PIPES, BRASS, COPPER ALLOYS, NICKEL ALLOYS.) PIPE FITTINGS, VIBRATION ISOLATORS, SPRINGS.

AD-271 511 62-2-2 DIV. 8
NAVAL SUPERSONIC LAB., MASS. INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*BAND-PASS FILTERS, *ACOUSTIC FILTERS, NARROWBAND, MINIATURE ELECTRONIC EQUIPMENT, DESIGN.) (*AUDIO AMPLIFIERS, *INFRARED DETECTORS, SIGNAL-TO-NOISE RATIO, NOISE (RADIO), REDUCTION, EFFECTIVENESS, THEORY, MATHEMATICAL ANALYSIS.)

*ACOUSTIC IMPEDANCE

AD-271 410 62-2-2 DIV. 8
DEFENSE RESEARCH LAB., U. OF TEXAS, AUSTIN.
DESCRIPTORS: (*ACOUSTIC FILTERS, *ACOUSTIC IMPEDANCE, FLUIDS.) (MEASUREMENT, WAVE TRANSMISSION, WATER, PIPES, BRASS, COPPER ALLOYS, NICKEL ALLOYS.) PIPE FITTINGS, VIBRATION ISOLATORS, SPRINGS.

AD-271 460 62-2-2 DIV. 31
J. G. ENGINEERING RESEARCH ASSOCIATES, BALTIMORE, MD.
DESCRIPTORS: (*SUBMARINE HULLS, VIBRATION, PRESSURE, *ACOUSTIC IMPEDANCE, THEORY.) (SHIP HULLS, SHIP MODELS, STRUCTURAL SHELLS, CYLINDRICAL BODIES, STRESSES, *HYDRODYNAMICS, ACOUSTICS, INTEGRAL EQUATIONS, FUNCTIONS, TRIGONOMETRY.)

*ADHESIVES

AD-271 166 62-2-2 DIV. 1
BOEING CO., WICHITA, KANSAS.
DESCRIPTORS: (*AIRFRAMES, *MATERIALS, *METALS, *ALLOYS, TITANIUM ALLOYS, EXTRUSION, *CERAMIC COATINGS, *REFRACTORY COATINGS, FLAME SPRAYING, SEALING COMPOUNDS, ELASTOMERS, *PLASTICS, EXPANDED PLASTICS, *ADHESIVES, RESIN ADHESIVES, SANDWICH CONSTRUCTION, HONEYCOMB CORES, LAMINATES, HOSES.) (MECHANICAL PROPERTIES, TENSILE PROPERTIES, CLIMATIC FACTORS, FAILURE (MECHANICS), HIGH TEMPERATURE RESEARCH.) (POLYMERS, FLUORIDES, FLUOROCARBONS, SILICONES, SILANES, URETHANES, PYRIMIDINES.)

AD-271 176 62-2-2 DIV. 14
GENERAL DYNAMICS/ASTRONAUTICS, SAN DIEGO, CALIF.
DESCRIPTORS: (*HIGH TEMPERATURE RESEARCH, NIOBIUM ALLOYS, *ALLOYS, *REFRACTORY MATERIALS, REFRACTORY COATINGS.) (*LOW TEMPERATURE RESEARCH, *ADHESIVES, METALS, THERMAL INSULATION, ALLOYS, STAINLESS STEEL, AUSTENITE.) (MECHANICAL PROPERTIES, DEFORMATION, PLASTICITY, NUCLEAR REACTIONS, RADIATION EFFECTS.) (*PLASTICS, *FLUOROCARBONS, CERAMIC MATERIALS.)

AD-271 429 62-2-2 DIV. 17
NARMCO INDUSTRIES, INC., SAN DIEGO, CALIF.
DESCRIPTORS: (*STAINLESS STEEL, SHEETS, *SANDWICH PANELS, *HONEYCOMB CORES, BONDING, BONDED JOINTS, METAL JOINTS, BRAZING.) (*ADHESIVES, *METAL SEALS, SEALS, MATERIALS, CERAMIC MATERIALS, GLASS, COPPER ALLOYS, SILVER ALLOYS.) (HIGH TEMPERATURE RESEARCH, HIGH PRESSURE RESEARCH, PROCESSING, MECHANICAL PROPERTIES, TENSILE PROPERTIES.)

AD-271 588 62-2-2 DIV. 8
NARMCO INDUSTRIES, INC., SAN DIEGO, CALIF.
DESCRIPTORS: (*RADOMES, AIRBORNE, *CERAMIC MATERIALS, *ALUMINUM COMPOUNDS, *OXIDES, BONDING, *BRAZING, *ADHESIVES, HIGH TEMPERATURE RESEARCH.) (REFRACTORY MATERIALS, MOLYBDENUM ALLOYS, DIFFUSION, NICKEL, PLATINUM ALLOYS, PALLADIUM ALLOYS, GOLD ALLOYS, IRIDIUM ALLOYS, RUTHENIUM ALLOYS.) (COATINGS, MOLYBDENUM, FLAME SPRAYING, PLASMA JETS.) (METAL JOINTS, MICROSTRUCTURE.) EPOXY RESINS.

*AERIAL CAMERAS

AD-271 591 62-2-2 DIV. 26
FAIRCHILD CAMERA AND INSTRUMENT CORP., SYOSSET, N. Y.
DESCRIPTORS: (*WIDE FIELD CAMERAS, *AERIAL CAMERAS, PRISMS (OPTICS), PANORAMIC SCANNERS FOR AERIAL RECONNAISSANCE, DESIGN, EFFECTIVENESS.)

*AERIAL PHOTOGRAPHY

AD-271 438 62-2-2 DIV. 2
GEOAUTICS, INC., WASHINGTON, D. C.
DESCRIPTORS: (*GEODESICS, *AERIAL PHOTOGRAPHY, *MAPPING, ROCKETS, PHOTOFLASH PROJECTILES.) (PHOTOGRAPHIC EQUIPMENT, GEODESICS, PHOTOFLSH BULBS.) (TRIGONOMETRY, GEODESICS.)

*AERIAL RECONNAISSANCE

AD-271 062 62-2-2 DIV. 6
ANTENNA LAB., OHIO STATE U. RESEARCH FUNDATION, COLUMBUS.
DESCRIPTORS: (*AERIAL RECONNAISSANCE, *EXTRA TERRESTRIAL BASES, *RADIOMETERS, THERMAL TARGETS, THERMAL RADIATION, MICROWAVES, TERRAIN, WAVE TRANSMISSION, REFLECTION, DETECTION, SCATTERING, ATTENUATION, MILITARY INTELLIGENCE, FEASIBILITY STUDIES.) (ANTIRADAR COATINGS, RADAR ECHO AREAS, TEMPERATURE, RADAR TARGET, MEASUREMENT.)

AD-271 440 62-2-2 DIV. 10
B SINGER, INC., STATE COLLEGE, PA.
DESCRIPTORS: (*AERIAL RECONNAISSANCE, *DISPLAY SYSTEMS, DATA PROCESSING SYSTEMS, INFORMATION THEORY, COMBAT INFORMATION CENTERS, AIR CONTROL CENTERS, *HUMAN ENGINEERING, DESIGN.) (RADAR EQUIPMENT, TARGETS, TARGET RECOGNITION, CODING BY COLORS, CONFIGURATION.)

*AERODYNAMIC HEATING

AD-271 529 62-2-2 DIV. 9
AERONAUTICAL SYSTEMS DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: *SYMPOSIA, AIRFRAMES, STRUCTURES, *AERODYNAMIC HEATING, THERMODYNAMICS, DYNAMICS, AERODYNAMICS, *RE-ENTRY AERODYNAMICS, ELASTICITY, STABILITY, FLUTTER, LOAD DISTRIBUTION, HYPERSONICS, THERMAL STRESSES, HEAT TRANSFER, RE-ENTRY VEHICLES.

*AERODYNAMICS

AD-270 924 62-2-2 DIV. 9
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*SHEETS, SEPARATION, PRESSURE, WEDGES, CURVED PROFILES, SURFACE PROPERTIES, *AERODYNAMICS, MACH NUMBER.) (GASES, SUPERSONIC FLOW, TURBULENT BOUNDARY LAYER, SHOCK WAVES, REYNOLDS NUMBER, WIND TUNNELS.) (FEASIBILITY STUDIES.)

AD-270 986 62-2-2 DIV. 9
PRINCETON U., N. J.
DESCRIPTORS: (EXPERIMENTAL DATA, *WINGS, AERODYNAMIC CONFIGURATIONS, *AERODYNAMICS, *MOMENTS, WIND TUNNELS, SUBSONIC FLOW, VARIABLE PITCH PROPELLERS,) (*SHORT TAKE-OFF PLANES, AERODYNAMICS.) (LIFT, DRAG.)

*AIR CONDITIONING EQUIPMENT

AD-271 394 62-2-2 DIV. 13
IMC MAGNETICS CORP., WESTBURY, LONG ISLAND, N. Y.
DESCRIPTORS: (ELECTRIC MOTORS, BLOWERS, *AIR CONDITIONING EQUIPMENT, *COOLING FANS FOR SHIPBORNE ELECTRONIC EQUIPMENT,) MILITARY REQUIREMENTS, SPECIFICATIONS, DESIGN, TESTS, DIELECTRIC PROPERTIES, RADIO INTERFERENCE, VIBRATION, IMPACT SHOCK, TEMPERATURE, HUMIDITY.

*AIR TRAFFIC

AD-271 547 62-2-2 DIV. 30
FEDERAL AVIATION AGENCY, WASHINGTON, D. C.
DESCRIPTORS: (*AIR TRAFFIC, *INSTRUMENT LANDINGS, NEW YORK, *AIR TRAFFIC CONTROL SYSTEMS, DATA PROCESSING SYSTEMS, DISPLAY SYSTEMS, ANALYSIS.)

*AIR TRAFFIC CONTROL SYSTEMS

AD-271 452 62-2-2 DIV. 2
BORG-WARNER CONTROLS DIV., BORG-WARNER CORP., SANTA ANA, CALIF.
DESCRIPTORS: (*CIVIL AVIATION, ALL WEATHER AVIATION, *CLIMATIC FACTORS, METEOROLOGY, METEOROLOGICAL DATA, *AIR TRAFFIC CONTROL SYSTEMS.)

*AIRCRAFT EQUIPMENT

AD-271 477 62-2-2 DIV. 28
NORTHROP CORP., HAWTHORNE, CALIF.
DESCRIPTORS: (*HUMAN ENGINEERING, *MAINTENANCE, *AIRCRAFT EQUIPMENT, ELECTRICAL EQUIPMENT, DESIGN, INDEXES.) (*ANTHROPOMETRY, TEST EQUIPMENT.) (AUTOMATIC, *TEST EQUIPMENT, MONITORS, TEST SETS.) HANDBOOKS.

*AIRFRAME BEARINGS

AD-271 539 62-2-2 DIV. 1
BOEING CO., SEATTLE, WASH.
DESCRIPTORS: (*AIRFRAME BEARINGS, BALL BEARINGS, SEATS, ATTACHMENT TO AIRFRAMES, ADHESIVES, EPOXY RESINS, PHENOLIC RESINS, SHEAR STRESSES, HIGH TEMPERATURE RESEARCH, REFRACORY MATERIALS, HEAT RESISTANT ALLOYS, DESIGN, TESTS.)

*AIRFRAMES

AD-271 106 62-2-2 DIV. 26
LODGE AND SHIPLEY CO., CINCINNATI, OHIO.
DESCRIPTORS: (*AIRFRAMES, *MAGNESIUM ALLOYS, PROCESSING, HYDROFORMING, DESIGN, PRODUCTION, MANUFACTURING METHODS.) (MACHINING OF CONICAL BODIES, CONFIGURATION, TEMPLATES.)

AD-271 166 62-2-2 DIV. 1
BOEING CO., WICHITA, KANSAS.
DESCRIPTORS: (*AIRFRAMES, *MATERIALS, *METALS, *ALLOYS, TITANIUM ALLOYS, EXTRUSION, *CERAMIC COATINGS, *REFRACTORY COATINGS, FLAME SPRAYING, SEALING COMPOUNDS, ELASTOMERS, *PLASTICS, EXPANDED PLASTICS, *ADHESIVES, RESIN ADHESIVES, SANDWICH CONSTRUCTION, HONEYCOMB CORES, LAMINATES, HOSES.) (MECHANICAL PROPERTIES, TENSILE PROPERTIES, CLIMATIC FACTORS, FAILURE (MECHANICS), HIGH TEMPERATURE RESEARCH.) (POLYMERS, FLUORIDES, FLUOROCARBONS, SILICONES, SILANES, URETHANES, PYRIMIDINES.)

AD-271 167 62-2-2 DIV. 1
BOEING CO., WICHITA, KANS.
DESCRIPTORS: (*AIRFRAMES, *RADOMES, *MATERIALS, METALS, ALLOYS, STAINLESS STEEL, CHEMICAL MILLING, PLATING, ALUMINUM, MANGANESE, CADMIUM PLATING, POLYMERS, HEAT RESISTANT POLYMERS, PLASTICS, ADHESIVES, RESIN ADHESIVES, ENAMEL COATINGS, VARNISHES, ORGANIC COATINGS, LAMINATES, TEXTILES, LUBRICANTS,) (METAL JOINTS, TITANIUM,) (BONDING, BRAZING, CERAMIC MATERIALS,) (JET FUELS, IGNITION,) (HIGH TEMPERATURE RESEARCH, MACHINING,)

*ALGAE

AD-271 578 62-2-2 DIV. 16
QUEEN MARY COLL., U. OF LONDON (ST. BRIT.).
DESCRIPTORS: (*ALGAE, *GLYCOLIC ACIDS, PHOTOSYNTHESIS, PRODUCTION,) (CARBON DIOXIDE, LIGHT, INTENSITY, ISONIAZID,) COLORIMETRIC ANALYSIS.

*ALGEBRAIC TOPOLOGY

AD-271 433 62-2-2 DIV. 15
INSTITUTE OF FIELD PHYSICS, U. OF NORTH CAROLINA, CHAPEL HILL.
DESCRIPTORS: (GREEN'S FUNCTION, *ALGEBRAIC TOPOLOGY, QUANTUM MECHANICS, *GROUPS (MATHEMAT-

ICS). DIFFERENTIAL EQUATIONS.) (NUMERICAL ANALYSIS. TRANSFORMATIONS (MATHEMATICS). MATRIX ALGEBRA. VECTOR ANALYSIS. INTEGRAL EQUATIONS. COMMUTATORS.)

*ALKALI METAL COMPOUNDS

AD-271 392 64-2-4 DIV. 25
ILLINOIS U., URBANA.
DESCRIPTORS: (*ALKALI METAL COMPOUNDS. *HALIDES. *CRYSTALS. *CRYSTAL STRUCTURE. EXCITATION. PHOTOCONDUCTIVITY. MEASUREMENT.) (FLUORESCENCE. LUMINESCENCE. LIFE EXPECTANCY. PULSE HEIGHT ANALYZERS. L BAND. RELAXATION TIME.) (POTASSIUM COMPOUNDS. CHLORIDES. BROMIDES. IODIDES.)

*ALKYL RADICALS

AD-271 592 64-2-4 DIV. 4
*WYANDOTTE CHEMICALS CORP., MICH.
DESCRIPTORS: (*ESTERS. *ALKYL RADICALS. *PERCHLORATES. SYNTHESIS. CHEMICAL REACTION. ALKYL RADICALS. IODIDES. SILVER COMPOUNDS. PERCHLORATES. COMPLEX COMPOUNDS. UREA. MOLECULAR STRUCTURE. STABILITY.) (X-RAY DIFFRACTION ANALYSIS. INFRARED SPECTROSCOPY.) EXPLOSIVS.

*ALLOYS

AD-271 009 64-2-4 DIV. 25
SYRACUSE U., N. Y.
DESCRIPTORS: (*FRACTURE (MECHANICS). *METALS. *ALLOYS. *TITANIUM ALLOYS. ALUMINUM ALLOYS. VANADIUM ALLOYS. STRESSES. DEFORMATION. PROPAGATION. GRAINS (METALLURGY). METALLURGICAL ANALYSIS. THEORY.)

AD-271 166 64-2-4 DIV. 1
BOEING CO., WICHITA, KANSAS.
DESCRIPTORS: (*AIRFRAMES. *MATERIALS. *METALS. *ALLOYS. TITANIUM ALLOYS. EXTRUSION. *CERAMIC COATINGS. *REFRACTORY COATINGS. FLAME SPRAYING. SEALING COMPOUNDS. ELASTOMERS. *PLASTICS. EXPANDED PLASTICS. *ADHESIVES. RESIN ADHESIVES. SANDWICH CONSTRUCTION. HONEYCOMB CORES. LAMINATES. HOSES.) (MECHANICAL PROPERTIES. TENSILE PROPERTIES. CLIMATIC FACTORS. FAILURE (MECHANICS). HIGH TEMPERATURE RESEARCH.) (POLYMERS. FLUORIDES. FLUOROCARBONS. SILICONES. SILANES. URETHANES. PYRIMIDINES.)

AD-271 176 64-2-4 DIV. 14
GENERAL DYNAMICS/ASTRONAUTICS, SAN DIEGO, CALIF.
DESCRIPTORS: (*HIGH TEMPERATURE RESEARCH. NIOBIUM ALLOYS. *ALLOYS. *REFRACTORY MATERIALS. REFRACTORY COATINGS.) (*LOW TEMPERATURE RESEARCH. *ADHESIVES. METALS. THERMAL INSULATION. ALLOYS. STAINLESS STEEL. AUSTENITE.) (MECHANICAL PROPERTIES. DEFORMATION. PLASTICITY. NUCLEAR REACTIONS. RADIATION EFFECTS.) (*PLASTICS. *FLUOROCARBONS. CERAMIC MATERIALS.)

AD-271 536 64-2-2 DIV. 26
DOUGLAS AIRCRAFT CO., INC., LONG BEACH, CALIF.
DESCRIPTORS: (*ALLOYS, AND *METALS FOR AIRCRAFT. MATERIALS AND STRUCTURES. PRODUCTION BY *CHEMICAL MILLING. GELS. CARBOXYMETHYLCELLULOSE. POROUS MATERIALS. SOLIDS. SOLUTIONS CHEMICALS.) (PROCESSING. STEEL. STAINLESS STEEL. NICKEL ALLOYS. TITANIUM ALLOYS. VANADIUM ALLOYS. CHROMIUM ALLOYS. ALUMINUM ALLOYS. *REFRACTORY MATERIALS. HEAT RESISTANT ALLOYS. MOLYBDENUM ALLOYS. TITANIUM ALLOYS. TANTALUM. NIOBIUM.)

*ALUMINUM

AD-270 949 64-2-4 DIV. 14
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
DESCRIPTORS: (*THERMAL RADIATION. RADIATION EFFECTS. ATOMIC BOMB EXPLOSIONS. NUCLEAR EXPLOSIONS. HEAT TRANSMISSION. *GLASS. COATINGS. PROTECTIVE COVERINGS. *ALUMINUM. SHEETS. *FIRE SCREENS.) (TEST METHODS. TEST EQUIPMENT. SPECTROPHOTOMETERS. INDICATOR PAPERS.)

AD-271 123 64-2-2 DIV. 17
RUTGERS U. COLL. OF ENGINEERING, NEW BRUNSWICK, N. J.
DESCRIPTORS: (*ALUMINUM. *CRYSTALS. GRAINS (METALLURGY). *CRYSTALLIZATION. GROWTH. DEFORMATION. LATTICES. MICROSTRUCTURE. ELECTRON MICROSCOPY. X-RAY DIFFRACTION ANALYSIS.) METALS.

AD-271 128 64-2-2 DIV. 17
VIRGINIA INST. FOR SCIENTIFIC RESEARCH, RICHMOND.
DESCRIPTORS: (METALS. *ALUMINUM. *CORROSION. OXIDATION. AIR. MERCURY COMPOUNDS. IODIDES. HUMIDITY.) (*CORROSION RESEARCH. TEST METHODS. OXIDES. X-RAY DIFFRACTION ANALYSIS.) (CORROSIVE LIQUIDS. SALTS. PHOSPHATES. CHLORIDES. NITRATES. SULFATES. BROMIDES. CHROMATES.)

AD-271 401 64-2-2 DIV. 17
LITTLE, ARTHUR D., INC., CAMBRIDGE, MASS.
DESCRIPTORS: (*ALUMINUM. *EXPLOSIVE FORMING.) (TESTS. ELASTICITY. *WAVE TRANSMISSION. PLASTICITY. STRESSES. TENSILE PROPERTIES. *MECHANICAL PROPERTIES.) *METALS. ALLOYS.

AD-271 409 64-2-2 DIV. 20
PALMER PHYSICAL LAB., PRINCETON U., N. J.
DESCRIPTORS: (*PROTON BOMBARDMENT. PROTON BEAMS. *ALUMINUM. BERYLLIUM. PARTICLES. MESONS. ANTIPROTONS. VELOCITY. MEASUREMENT. DEUTERONS. TRITONS.) SYNCHROTRONS.

AD-271 421 64-2-2 DIV. 25
GEORGIA INST. OF TECH., ENGINEERING EXPERIMENT STATION, ATLANTA.
DESCRIPTORS: (*CRYSTALS. SINGLE CRYSTALS. *ALUMINUM. *SILVER COMPOUNDS. *SODIUM COMPOUNDS. *CHLORIDES. X-RAY DIFFRACTION ANALYSIS. CRYSTAL STRUCTURE. TEMPERATURE. HIGH TEMPERATURE RESEARCH. THERMAL EXPANSION. THERMAL DIFFUSION. THEORY.) (TEST METHODS. TEST EQUIPMENT. X-RAY FILTERS.)

*ALUMINUM COMPOUNDS

AD-271 183 64-2-2 DIV. 14
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*DIELECTRICS. DIELECTRIC PROPERTIES. HIGH TEMPERATURE RESEARCH. VERY HIGH FREQUENCY. RADOMES. MISSILE WINDOWS.) (*CERAMIC MATERIALS. *ALUMINUM COMPOUNDS. *OXIDES. REINFORCING MATERIALS. *PLASTICS. RESONANCE. TEST METHODS.)

AD-271 588 64-2-4 DIV. 8
NARMCO INDUSTRIES, INC., SAN DIEGO, CALIF.
DESCRIPTORS: (*RADOMES. AIRBORNE. *CERAMIC MATERIALS. *ALUMINUM COMPOUNDS. *OXIDES. BONDING. *BRAZING. *ADHESIVES. HIGH TEMPERATURE RESEARCH.) (REFRACTORY MATERIALS. MOLYBDENUM ALLOYS. DIFFUSION. NICKEL. PLATINUM ALLOYS. PALLADIUM ALLOYS. GOLD ALLOYS. IRIDIUM ALLOYS. RUTHENIUM ALLOYS.) (COATINGS. MOLYBDENUM. FLAME SPRAYING. PLASMA JETS.) (METAL JOINTS. MICROSTRUCTURE.) EPOXY RESINS.

*ANALYSIS OF VARIANCE

AD-271 442 64-2-2 DIV. 2
PHOTOGRAMMETRY LAB., MASS. INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*ATMOSPHERIC REFRACTION. LENSES. DISTORTION. ERRORS. *ANALYSIS OF VARIANCE. GEODESICS. *MAPPING.)

*ANOXIA

AD-271 554 64-2-2 DIV. 16
HEALTH RESEARCH, INC., BUFFALO, N. Y.
DESCRIPTORS: (*RESPIRATORS. *ARTIFICIAL RESPIRATION. SIMULATION. TEST EQUIPMENT. DESIGN.) (*ANOXIA. ANESTHESIA. RESPIRATION. TRAINING. TRAINING DEVICES.)

*ANTENNA RADIATION PATTERNS

AD-271 026 64-2-2 DIV. 5
SYLVANIA ELECTRIC PRODUCTS, INC., WALTHAM, MASS.
DESCRIPTORS: (*ANTENNAS. *ANTENNA RADIATION PATTERNS. *RADIO COMMUNICATION SYSTEMS. *RADIO SIGNALS. DESIGN.) (RADIO WAVES. ATMOSPHERE. SCATTERING. TRACKING. THEORY. MEASUREMENT. STATISTICAL ANALYSIS. EFFECTIVENESS. CONFIGURATION.) (MICROWAVES. RADIO TRANSMISSION. *RADIO RECEPTION. DIVERSITY SYSTEMS.)

AD-271 164 64-2-2 DIV. 25
APPLIED PHYSICS LAB., JOHNS HOPKINS U., SILVER SPRING, MD.
DESCRIPTORS: (*ANTENNA RADIATION PATTERNS. DESIGN. CONICAL ANTENNAS. HELICAL ANTENNAS.) (IMPEDANCE. SURFACES. MOTION.)

AD-271 378 64-2-4 DIV. 8
APPLIED PHYSICS LAB., JOHNS HOPKINS U., SILVER SPRING, MD.
DESCRIPTORS: (*SATELLITE VEHICLE ANTENNAS. *DIPOLE ANTENNAS. THEORY.) (*ANTENNAS. ELECTRIC FIELDS. *ANTENNA RADIATION PATTERNS. MATHEMATICAL ANALYSIS.)

*ANTENNAS

AD-271 026 64-2-4 DIV. 5
SYLVANIA ELECTRIC PRODUCTS, INC., WALTHAM, MASS.
DESCRIPTORS: (*ANTENNAS. *ANTENNA RADIATION PATTERNS. *RADIO COMMUNICATION SYSTEMS. *RADIO SIGNALS. DESIGN.) (RADIO WAVES. ATMOSPHERE. SCATTERING. TRACKING. THEORY. MEASUREMENT. STATISTICAL ANALYSIS. EFFECTIVENESS. CONFIGURATION.) (MICROWAVES. RADIO TRANSMISSION. *RADIO RECEPTION. DIVERSITY SYSTEMS.)

*ANTHRONES

AD-271 443 64-2-4 DIV. 16
NAVAL MEDICAL RESEARCH LAB., NEW LONDON, CONN.
DESCRIPTORS: (*GLUCOSE. *ANTHRONES. REAGENTS. *COLORIMETRY. PHOTOELECTRIC CELLS. MEASUREMENT.) *BODY FLUIDS.

*ANTHROPOMETRY

AD-271 138 64-2-4 DIV. 32
CIVIL AEROMEDICAL RESEARCH INST., OKLAHOMA CITY, OKLA.
DESCRIPTORS: (*BODY WEIGHT. BODY. PRESSURE. DISTRIBUTION.) *ANTHROPOMETRY.

AD-271 477 64-2-4 DIV. 28
NORTHROP CORP., HAWTHORNE, CALIF.
DESCRIPTORS: (*HUMAN ENGINEERING. *MAINTENANCE. *AIRCRAFT EQUIPMENT. ELECTRICAL EQUIPMENT. DESIGN. INDEXES.) (*ANTHROPOMETRY. TEST EQUIPMENT.) (AUTOMATIC. *TEST EQUIPMENT. MONITORS. TEST SETS.) HANDBOOKS.

*ANTIMONIDES

AD-271 469 64-2-4 DIV. 25
NAVAL ORDNANCE LAB., WHITE OAK, MD.
DESCRIPTORS: (*SEMICONDUCTORS. *INDIUM COMPOUNDS. *GALLIUM COMPOUNDS. *ARSENICES. *ANTIMONIDES. INTERMETALLIC COMPOUNDS. OPTICS. REFLECTION. REFRACTIVE INDEX. REFRACTIVE PROPERTIES. LIGHT. ABSORPTION. MATHEMATICAL ANALYSIS. INTEGRAL EQUATIONS.) (ULTRAVIOLET SPECTROSCOPY. INFRARED SPECTROSCOPY. SPECTROPHOTOMETERS. PHOTOMULTIPLIERS.)

*APTITUDE TESTS

AD-271 148 64-2-2 DIV. 26
EDUCATIONAL TESTING SERVICE, PRINCETON, N. J.
DESCRIPTORS: (*APTITUDE TESTS. *PERSONALITY TESTS. STATISTICAL ANALYSIS. *MATHEMATICAL PREDICTION. COMPUTERS.)

AD-271 386 64-2-2 DIV. 26
EDUCATIONAL TESTING SERVICE, PRINCETON, N. J.
DESCRIPTORS: (*APTITUDE TESTS. *ACHIEVEMENT TESTS. STATISTICAL ANALYSIS. RELIABILITY. ANALYSIS OF VARIANCE.)

*ARGON

AD-270 919 64-2-2 DIV. 25
CORNELL U., ITHACA, N. Y.
DESCRIPTORS: (*ARGON. *X-RAY SPECTRUM. *FLUORESCENCE. MEASUREMENT. PULSE HEIGHT ANALYZERS. ATOMIC STRUCTURE.) (RADIOACTIVE ISOTOPES. IRON.)

*ARSENIDES

AD-271 469 64-2-4 DIV. 25
NAVAL ORDNANCE LAB., WHITE OAK, MD.
DESCRIPTORS: (*SEMICONDUCTORS. *INDIUM COMPOUNDS. *GALLIUM COMPOUNDS. *ARSENICES. *ANTIMONIDES. INTERMETALLIC COMPOUNDS. OPTICS. REFLECTION. REFRACTIVE INDEX. REFRACTIVE PROPERTIES. LIGHT. ABSORPTION. MATHEMATICAL ANALYSIS. INTEGRAL EQUATIONS.) (ULTRAVIOLET SPECTROSCOPY. INFRARED SPECTROSCOPY. SPECTROPHOTOMETERS. PHOTOMULTIPLIERS.)

*ARTIFICIAL RESPIRATION

AD-271 554 64-2-2 DIV. 16
HEALTH RESEARCH, INC., BUFFALO, N. Y.
DESCRIPTORS: (*RESPIRATORS. *ARTIFICIAL RESPIRATION. SIMULATION. TEST EQUIPMENT. DESIGN.) (*ANOXIA. ANESTHESIA. RESPIRATION. TRAINING. TRAINING DEVICES.)

*ARTILLERY

AD-271 353 64-2-4 DIV. 22
ROCK ISLAND ARSENAL LAB., ILL.
DESCRIPTORS: (*GUNS. *ARTILLERY. *SPOTTING RIFLES. *RECOIL MECHANISMS. FEASIBILITY STUDIES. MATHEMATICAL ANALYSIS. DESIGN. TESTS.)

*ASTROPHYSICS

AD-271 004 64-2-2 DIV. 2
MICROWAVE LAB., STANFORD U., CALIF.
DESCRIPTORS: (*ASTROPHYSICS. ELECTROMAGNETIC WAVES. *PLASMA OSCILLATIONS. THERMAL RADIATION. PLASMA PHYSICS.) (SHOCK WAVES. MAGNETOHYDRODYNAMICS.) (EXTRATERRESTRIAL RADIO WAVES. MAGNETIC STORMS. *SOLAR FLARES. SOLAR CORONA. TERRESTRIAL MAGNETISM. GAS IONIZATION.) (HARMONIC ANALYSIS. NONLINEAR SYSTEMS.)

*ATMOSPHERE

AD-271 636 64-2-4 DIV. 2
*WOODS HOLE OCEANOGRAPHIC INSTITUTION, MASS.
DESCRIPTORS: (BAHAMA ISLANDS. *ATMOSPHERE. *WATER VAPOR. MEASUREMENT. STATISTICAL ANALYSIS. *IND.)

*ATMOSPHERIC ELECTRICITY

AD-271 512 64-2-4 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*IONOSPHERE, IONIZATION.) (*AURORAE. NIGHT SKY. LUMINESCENCE.) (*SOLAR CORONA. SOLAR FLARES. POLARIZATION.) VAN ALLEN RADIATION BELT. *COSMIC RAYS. *ATMOSPHERIC ELECTRICITY. *PLASMA PHYSICS.

AD-271 515 64-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*SUNSPOTS. HYDRODYNAMICS.) (SUNSPOTS. THEORY.) (IONOSPHERIC DISTURBANCES. SOLAR FLARES.) (*IONOSPHERE, IONIZATION.) (IONOSPHERE. TERRESTRIAL MAGNETISM.) (*AURORAE. ANTARCTIC REGIONS.) (AURORAE. MEASUREMENT. RADAR. PHOTOMETERS. SPECTROGRAPHIC ANALYSIS. PHOTOGRAPHIC ANALYSIS.) (*EARTH. *ELECTRIC CURRENTS.) SOLAR ATMOSPHERE. *COSMIC RAYS. *ATMOSPHERIC ELECTRICITY.

*ATMOSPHERIC REFRACTION

AD-271 442 64-2-4 DIV. 2
PHOTOGRAMMETRY LAB., MASS. INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*ATMOSPHERIC REFRACTION. LENSES. DISTORTION. ERRORS. *ANALYSIS OF VARIANCE. GEODESICS. *MAPPING.)

*ATOMIC ENERGY LEVELS

AD-271 417 64-2-2 DIV. 25
GENERAL ATOMIC DIV., GENERAL DYNAMICS CORP., SAN DIEGO, CALIF.
DESCRIPTORS: (*HYDROGEN, ATOMS, *OXYGEN, *HELIUM, *HEAT TRANSFER, *SCATTERING, PROTONS, *ATOMIC ENERGY LEVELS, RESONANCE.) (ION BEAMS, PHOTOELECTRIC CELLS, OSCILLOSCOPES, ELECTRON GUNS.)

*ATOMIC ORBITALS

AD-271 359 64-2-2 DIV. 20
SARAH MELLON SCAIFE RADIATION LAB., U. OF PITTSBURGH, PA.
DESCRIPTORS: (*ELECTRONS, NUCLEAR PHYSICS, NUCLEAR ENERGY, GASES, *POSITRONIUM, ELECTRIC FIELDS, PARTICLES, MAGNETIC FIELDS, SCATTERING, POLARIZATION.) (*ATOMIC ORBITALS, MOMENTS, BETA RAY PARTICLES, GAMMA RAYS, ARGON, NITROGEN, OXYGEN.) (GEOMETRY, MATHEMATICAL ANALYSIS.)

*AUDIO AMPLIFIERS

AD-271 511 64-2-2 DIV. 8
NAVAL SUPERSONIC LAB., MASS. INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*BAND-PASS FILTERS, *ACOUSTIC FILTERS, NARROWBAND, MINIATURE ELECTRONIC EQUIPMENT, DESIGN.) (*AUDIO AMPLIFIERS, *INFRARED DETECTORS, SIGNAL-TO-NOISE RATIO, NOISE (RADIO), REDUCTION, EFFECTIVENESS, THEORY, MATHEMATICAL ANALYSIS.)

*AUDITORY PERCEPTION

AD-271 509 64-2-2 DIV. 28
RESEARCH CENTER FOR GROUP DYNAMICS, U. OF MICHIGAN, ANN ARBOR.
DESCRIPTORS: (*PSYCHOLOGY, PERCEPTION, *AUDITORY PERCEPTION, CONDITIONED REFLEX, REACTION (PSYCHOLOGY), TRAINING, LEARNING, STIMULATION, INTENSITY, LABORATORY ANIMALS, PIGEONS.)

AD-271 605 64-2-2 DIV. 28
BOLT, BERANEK, AND NEWMAN, INC., CAMBRIDGE, MASS.
DESCRIPTORS: (*SPEECH TRANSMISSION, RADIO COMMUNICATION SYSTEMS, NOISE (RADIO).) (*AUDITORY PERCEPTION, AUDITORY ACUITY, AUDIOMETRY, TONAL THRESHOLDS, PITCH DISCRIMINATION.)

*AURORAE

AD-271 512 64-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*IONOSPHERE, IONIZATION.) (*AURORAE, NIGHT SKY, LUMINESCENCE.) (*SOLAR CORONA, SOLAR FLARES, POLARIZATION.) VAN ALLEN RADIATION BELT, *COSMIC RAYS, *ATMOSPHERIC ELECTRICITY, *PLASMA PHYSICS.

AD-271 515 64-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*SUNSPOTS, HYDRODYNAMICS.) (SUNSPOTS, THEORY.) (IONOSPHERIC DISTURBANCES, SOLAR FLARES.) (*IONOSPHERE, IONIZATION.) (IONOSPHERE, TERRESTRIAL MAGNETISM.) (*AURORAE, ANTARCTIC REGIONS.) (AURORAE, MEASUREMENT, RADAR, PHOTOMETERS, SPECTROGRAPHIC ANALYSIS, PHOTOGRAPHIC ANALYSIS.) (*EARTH, *ELECTRIC CURRENTS.) SOLAR ATMOSPHERE, *COSMIC RAYS, *ATMOSPHERIC ELECTRICITY.

*AUSTENITE

AD-270 904 64-2-2 DIV. 17
ILLINOIS U., URBANA.
DESCRIPTORS: (*IRON ALLOYS, NICKEL ALLOYS, *AUSTENITE, *MARTENSITE, *PHASE TRANSITIONS, PHASE STUDIES, MICROSTRUCTURE, CRYSTAL STRUCTURE, LATTICES, TRANSITION TEMPERATURE, X-RAY DIFFRACTION ANALYSIS.) ALLOYS.

*AVIATION SAFETY

AD-271 613 64-2-2 DIV. 1
GENERAL DYNAMICS/FORT WORTH, TEX.
DESCRIPTORS: (*ACCELERATION, GRAVITY, THRUST, BODY, ANTHROPOMETRY, AVIATION PERSONNEL.) (*AVIATION SAFETY, *BAILOUT, *EJECTION SEAT, DESIGN, TEST METHODS, SAFETY HARNESS, COCKPITS, CATAPULTS.)

*BAILOUT

AD-271 613 64-2-2 DIV. 1
GENERAL DYNAMICS/FORT WORTH, TEX.
DESCRIPTORS: (*ACCELERATION, GRAVITY, THRUST, BODY, ANTHROPOMETRY, AVIATION PERSONNEL.) (*AVIATION SAFETY, *BAILOUT, *EJECTION SEAT, DESIGN, TEST METHODS, SAFETY HARNESS, COCKPITS, CATAPULTS.)

*BALLOONS

AD-271 120 64-2-2 DIV. 30
NEW YORK U. COLL. OF ENGINEERING, N. Y.
DESCRIPTORS: (BALLOONS, FLIGHT PATHS.) (METEOROLOGICAL BALLOONS, INSTRUMENTATION.) (COSMIC RAYS, MEASUREMENT, INSTRUMENTATION.) (TELEMETERING, TELEMETERING SYSTEMS.) *BALLOONS, BALLOON LAUNCHERS, ATMOSPHERE MODELS

*BAND-PASS FILTERS

AD-271 511 64-2-2 DIV. 8
NAVAL SUPERSONIC LAB., MASS. INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*BAND-PASS FILTERS, *ACOUSTIC FILTERS, NARROWBAND, MINIATURE ELECTRONIC EQUIPMENT, DESIGN.) (*AUDIO AMPLIFIERS, *INFRARED DETECTORS, SIGNAL-TO-NOISE RATIO, NOISE (RADIO), REDUCTION, EFFECTIVENESS, THEORY, MATHEMATICAL ANALYSIS.)

*BERYLLIUM

AD-271 409 64-2-2 DIV. 20
PALMER PHYSICAL LAB., PRINCETON U., N. J.
DESCRIPTORS: (*PROTON BOMBARDMENT, PROTON BEAMS, *ALUMINUM, *BERYLLIUM, PARTICLES, MESONS, ANTIPROTONS, VELOCITY, MEASUREMENT, DEUTERONS, TRITONS.) SYNCHROTRONS.

AD-271 508 64-2-2 DIV. 10
AERONUTRONIC, NEWPORT BEACH, CALIF.
DESCRIPTORS: (SOLID ROCKET PROPELLANTS, LIQUID ROCKET PROPELLANTS, *FUEL ADDITIVES, *BERYLLIUM, BERYLLIUM COMPOUNDS, OXIDES, COMBUSTION, CHEMICAL REACTIONS, THERMODYNAMICS, TESTS.) (COMBUSTION CHAMBER GASES, EXHAUST GASES, HYDROGEN, BERYLLIUM COMPOUND, HYDROXIDES, VAPORS, HEAT OF FORMATION, MASS SPECTROSCOPY, SPECTROGRAPHIC ANALYSIS.)

*BERYLLIUM ALLOYS

AD-270 977 64-2-2 DIV. 17
ELECTRO-OPTICAL SYSTEMS, INC., PASADENA, CALIF.
DESCRIPTORS: (ALLOYS, *BERYLLIUM ALLOYS, ALUMINUM ALLOYS, COPPER ALLOYS, SILICON ALLOYS, NICKEL ALLOYS, PHASE STUDIES, COOLING, X-RAY DIFFRACTION ANALYSIS.) (PHASE TRANSITIONS, MICROSTRUCTURE, LATTICES.)

*BERYLLIUM COMPOUNDS

AD-270 957 64-2-2 DIV. 25
INSTITUTE FOR MOLECULAR PHYSICS, U. OF MARYLAND, COLLEGE PARK.
DESCRIPTORS: (*QUANTUM MECHANICS, ELECTRON TRANSITIONS, MOLECULES, IONS, *HYDRIDES, *BERYLLIUM COMPOUNDS, *CARBON COMPOUNDS, METHANES, ENERGY, THEORY, MATHEMATICAL ANALYSIS.)

*BIBLIOGRAPHY

AD-270 900 64-2-2 DIV. 17
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: (ALLOYS, ALUMINUM ALLOYS, HAFNIUM ALLOYS, HEAT RESISTANT ALLOYS, METAL PLATES, METALS, MOLYBDENUM ALLOYS, NIOBIUM ALLOYS, POWDER ALLOYS, REFRACTORY MATERIALS, RHENIUM ALLOYS, SHEETS, STAINLESS STEEL, STEEL, TANTALUM ALLOYS, TITANIUM ALLOYS, TUNGSTEN ALLOYS.) (VANADIUM ALLOYS, ZIRCONIUM ALLOYS.) (MANUFACTURING METHODS, METAL FORMING PRESSES, WELDING, EXTRUSION.) (EXPLOSIVES, SHOCK WAVES, ENERGY, TRANSMISSION WATER, OILS.) (AIRFRAMES, CYLINDRICAL BODIES, SPHERES, STRUCTURAL SHELLS, HEMISPHERICAL SHELLS.) *EXPLOSIVE FORMING, *BIBLIOGRAPHY, *METALLURGY, HARDENING, USSR, GREAT BRITAIN.

AD-270 920 64-2-2 DIV. 16
BIOLOGICAL LABS., FREDERICK, MD.
DESCRIPTORS: (*BIBLIOGRAPHY, *FUNGUS INFECTIONS.) (DIAGNOSIS, CULTURE MEDIA, IMMUNIZATION, CHEMOTHERAPEUTIC AGENTS, DISEASE CARRIERS, EXPERIMENTAL DATA.)

AD-270 950 64-2-2 DIV. 25
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
DESCRIPTORS: (*THERMAL RADIATION, PRODUCTION, *RADIATION EFFECTS, MATERIALS, BIBLIOGRAPHY.) (SKIN, SIMULATION, TESTS.) LABORATORY EQUIPMENT.

AD-271 000 64-2-2 DIV. 25
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: (*CRYOGENICS, *LOW TEMPERATURE RESEARCH, *SUPERCONDUCTIVITY, THERMODYNAMICS, TRANSPORT PROPERTIES.) (ROCKET FUELS, LIQUID ROCKET PROPELLANTS, ROCKET OXIDIZERS, LIQUEFIED GASES, FLUORINE, HYDROGEN, OXYGEN, NITROGEN, OZONE.) (HAZARDS, HANDLING, STORAGE.) (GUIDED MISSILES, SURFACE TO SURFACE, SATELLITE VEHICLES.) (MATERIALS, ADHESIVES, SEALS, ELASTOMERS, LUBRICANTS, ALLOYS, ALUMINUM ALLOYS, COPPER ALLOYS, MAGNESIUM ALLOYS, MOLYBDENUM ALLOYS, NICKEL ALLOYS, STEEL, STAINLESS STEEL, TITANIUM ALLOYS.) (COMPUTERS, MEMORY DEVICES, DIGITAL COMPUTERS.) *BIBLIOGRAPHY, GYROSCOPES, INSTRUMENTATION.

AD-271 017 64-2-2 DIV. 28
HUMAN RESOURCES RESEARCH OFFICE, GEORGE WASHINGTON U., WASHINGTON, D. C.
DESCRIPTORS: (*BIBLIOGRAPHY, HUMAN ENGINEERING.) (MILITARY RESEARCH, REPORTS.) (*MILITARY OPERATIONS, TRAINING, MILITARY TRAINING.)

AD-271 033 64-2-2 DIV. 12
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*BIBLIOGRAPHY, *MOON, GEOLOGY, SPACESHIPS, LUNAR PROBES, MANNED, GUIDED MISSILE TRAJECTORIES, ROCKET TRAJECTORIES, SATELLITE VEHICLE TRAJECTORIES, LANDING.)

AD-271 034 64-2-2 DIV. 27
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*BIBLIOGRAPHY, *MATERIALS, METALS, *CONTAINERS, *LIQUID ROCKET PROPELLANTS, LIQUEFIED GASES.) (HYDROGEN, FLUORINE, HYDRAZINES, NITROGEN COMPOUNDS, TETROXIDES.)

AD-271 035 64-2-2 DIV. 8
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*BIBLIOGRAPHY, *PRINTED CIRCUITS, MANUFACTURING METHODS.)

AD-271 036 64-2-2 DIV. 20
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*BIBLIOGRAPHY, *RADIATION EFFECTS, *SOLAR CELLS, GLASS.)

AD-271 037 64-2-2 DIV. 5
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*RADIO COMMUNICATION SYSTEMS, COMMUNICATION SYSTEMS, MILITARY COMMUNICATIONS, AIR FORCE COMMUNICATIONS, RADIO RELAY SYSTEMS, *SATELLITE VEHICLES, AIRBORNE, *BIBLIOGRAPHY.)

AD-271 100 64-2-2 DIV. 25
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: *MASERS, *BIBLIOGRAPHY, *MICROWAVE AMPLIFIERS, *FREQUENCY STABILIZERS, USSR, ELECTRONICS, SCIENTIFIC RESEARCH, *RUBY, *PARAMAGNETIC RESONANCE, CRYOGENICS, PARAMETRIC AMPLIFIERS.

AD-271 150 64-2-2 DIV. 23
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: *TEACHING MACHINES, *BIBLIOGRAPHY, *TRAINING DEVICES, *LEARNING, *EDUCATION, *MILITARY TRAINING.

AD-271 170 64-2-2 DIV. 25
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: *PLASMA PHYSICS, *MAGNETOHYDRODYNAMICS, *BIBLIOGRAPHY, PLASMA JETS, PLASMA OSCILLATIONS, RE-ENTRY AERODYNAMICS, ATMOSPHERE ENTRY, INSTRUMENTATION, ELECTROMAGNETIC WAVES, SHOCK WAVES, MICROWAVES, GAS IONIZATION, MAGNETIC PINCH, PROPELLANTS, PROPULSION.

AD-271 351 64-2-2 DIV. 20
RADIATION EFFECTS INFORMATION CENTER, COLUMBUS, OHIO.
DESCRIPTORS: (CHEMISTRY, ELECTRONICS, POLYMERS, RADIATION DAMAGE, METALS, INORGANIC SUBSTANCES, ORGANIC COMPOUNDS, DOSIMETERS, *RADIATION EFFECTS, *BIBLIOGRAPHY.)

AD-271 372 64-2-2 DIV. 23
PERSONNEL LAB., AERONAUTICAL SYSTEMS DIV., LACKLAND AIR FORCE BASE, TEX.
DESCRIPTORS: (*JOB ANALYSIS, *BIBLIOGRAPHY, AIR FORCE.) (PERSONNEL, CLASSIFICATION.)

AD-271 523 64-2-2 DIV. 20
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*BIBLIOGRAPHY, *NUCLEAR REACTIONS, THERMONUCLEAR REACTIONS, PHOTONUCLEAR REACTIONS, USSR.)

AD-271 590 64-2-2 DIV. 4
UNIVERSITY OF SOUTHERN CALIF., LOS ANGELES.
DESCRIPTORS: (*CHEMICAL REACTIONS, REACTION KINETICS, *FREE RADICALS, *BIBLIOGRAPHY.) (OZONE, ORGANIC HALIDES, ALKYL RADICALS, HYDROGEN COMPOUNDS, ACETYL RADICALS, IODIDES, PROPANES, IODINE, PEROXIDES, BUTYL RADICALS, ACETONES, METHYL RADICALS, ETHERS.) (DECOMPOSITION, PHOTOLYSIS, PYROLYSIS.)

*BICARBONATES

AD-271 087 64-2-2 DIV. 16
DENTAL RESEARCH FACILITY, NAVAL TRAINING CENTER, GREAT LAKES, ILL.
DESCRIPTORS: (*SALIVA, *INFRARED SPECTROSCOPY, MAN, DETECTION, CHEMICAL PROPERTIES, ABSORPTION.) (*BICARBONATES, BIOCHEMICAL TESTS.)

*BINDERS

AD-270 982 64-2-2 DIV. 7
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.
DESCRIPTORS: (*MAGNETIC CORES, *MAGNETIC MATERIALS, METAL FILMS, STEEL, CERAMIC COATINGS, GLASS, *BINDERS, VISCOSITY, THERMAL EXPANSION.) (METAL FILMS, NICKEL PLATING, ELECTROPLATING, PROCESSING.) (CERAMIC COATINGS, GLASS, SILICON COMPOUNDS, SODIUM COMPOUNDS, TITANIUM COMPOUNDS, ZIRCONIUM COMPOUNDS, OXIDES.)

*BIRD NAVIGATION

AD-271 031 64-2-2 DIV. 16
HARVARD U. DIV. OF ENGINEERING AND APPLIED PHYSICS, CAMBRIDGE, MASS.
DESCRIPTORS: (BIRDS, *BIRD NAVIGATION, PSYCHOACOUSTICS, HEARING, SOUND, MEASUREMENT, POSITION FINDING, THEORY.) (*EAR, ANATOMY, SENSITIVITY TO FREQUENCY.)

*BLAST

AD-271 165 64-2-2 DIV. 22
BALLISTIC RESEARCH LABS., ABERDEEN PROVING GROUND, MD.
DESCRIPTORS: (*BLAST, *SHOCK WAVES, COPPER, *FIRE, *EXPLOSIONS, ARGON, INTERFEROMETERS, PLASMA PHYSICS, ELECTRONS, DENSITY.)

*BLUNT BODIES

AD-271 079 64-2-2 DIV. 9
CORNELL AERONAUTICAL LAB., INC., BUFFALO, N. Y.
DESCRIPTORS: (*BLUNT BODIES, GAS FLOW, CHEMICAL REACTIONS, DISSOCIATION, RECOMBINATION REACTIONS, HYPERSONICS, RE-ENTRY AERODYNAMICS, THEORY, MATHEMATICAL ANALYSIS.)

AD-271 577 64-2-2 DIV. 9
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (BODIES OF REVOLUTION, *BLUNT BODIES, CYLINDRICAL BODIES, SHOCK WAVES, BLAST, FLUID FLOW, GAS FLOW, THERMODYNAMICS, ENTHALPY, SUPERSONICS, HYPERSONICS, MATHEMATICAL ANALYSIS, EQUATIONS, THEORY.)

*BODY WEIGHT

AD-271 138 64-2-2 DIV. 32
CIVIL AEROMEDICAL RESEARCH INST., OKLAHOMA CITY, OKLA.
DESCRIPTORS: (*BODY WEIGHT, BODY, PRESSURE, DISTRIBUTION.) *ANTHROPOMETRY.

*BOMB FUZES

AD-271 598 64-2-2 DIV. 3
AIR FORCE PROVING GROUND COMMAND, EGLIN AIR FORCE BASE, FLA.
DESCRIPTORS: (*FIRE BOMBS, *INCENDIARY BOMBS, *BOMB FUZES, *ELECTRIC FUZES, PROCESSING, LOADING, RELIABILITY, FLIGHT TESTING, SAFETY, TEMPERATURE, PRESSURE, TESTS.)

*BOUNDARY LAYER

AD-271 646 64-2-2 DIV. 9
INSTITUTE OF ENGINEERING RESEARCH, U. OF CALIF., BERKELEY.
DESCRIPTORS: (*SUPERSONIC FLOW, *GAS IONIZATION, *FLUID MECHANICS, *PLASMA PHYSICS.) (DIFFUSION, PRESSURE, *BOUNDARY LAYER.) (SHOCK WAVES, IONS, DENSITY, TEMPERATURE, COOLING.) (WIND TUNNELS, ELECTRIC ARCS, HEATING.) DIFFERENTIAL EQUATIONS.

*BRAIN

AD-271 393 64-2-2 DIV. 16
AEROSPACE MEDICAL DIV., *WRIGHT AIR DEVELOPMENT DIV., *WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: (*BRAIN, *TISSUES (BIOLOGY), *METALS, *TRANSPLANTATION, HISTOLOGICAL SECTIONS, PATHOLOGY, AUTORADIOGRAPHS, ANIMALS.) RADIOGRAPHIC ANALYSIS.

*BRAZING

AD-271 427 64-2-2 DIV. 26
NARMCO INDUSTRIES, INC., SAN DIEGO, CALIF.
DESCRIPTORS: (*STAINLESS STEEL, *NICKEL ALLOYS, CHROMIUM ALLOYS, COBALT ALLOYS, *BRAZING, MATERIALS, CERAMIC MATERIALS, ADHESIVES, CHEMICAL REACTIONS, MANGANESE ALLOYS, NICKEL ALLOYS, BONDING, PROCESSING.)

AD-271 588 64-2-2 DIV. 8
NARMCO INDUSTRIES, INC., SAN DIEGO, CALIF.
DESCRIPTORS: (*RADOMES, AIRBORNE, *CERAMIC MATERIALS, *ALUMINUM COMPOUNDS, *OXIDES, BONDING, *BRAZING, *ADHESIVES, HIGH TEMPERATURE RESEARCH.) (REFRACTORY MATERIALS, MOLYBDENUM ALLOYS, DIFFUSION, NICKEL, PLATINUM ALLOYS, PALLADIUM ALLOYS, GOLD ALLOYS, IRIDIUM ALLOYS, RUTHENIUM ALLOYS.) (COATINGS, MOLYBDENUM, FLAME SPRAYING, PLASMA JETS.) (METAL JOINTS, MICROSTRUCTURE.) EPOXY RESINS.

*BRIDGES

AD-271 439 64-2-2 DIV. 2
GEONAUTICS, INC., WASHINGTON, D. C.
DESCRIPTORS: (GEODESICS, *GEODETIC ASTRONOMY, HIGH ALTITUDE, *PHOTOFLASH BOMBS IN SOUNDING ROCKETS FOR POSITION FINDING, *BRIDGES, RANGE CONTROL SYSTEMS FOR *MAPPING,) (TRIGNOMETRY, *PATRIX ALGEBRA, ERRORS, MATHEMATICAL ANALYSIS.) (GEODETIC DATA, DATA PROCESSING SYSTEMS.)

*BRILLOUIN ZONES

AD-271 666 64-2-2 DIV. 25
SLOANE PHYSICS LAB., YALE U., NEW HAVEN, CONN
DESCRIPTORS: (*CRYSTALS, CRYSTAL STRUCTURE, MAGNETIC PROPERTIES, PARAMAGNETIC CRYSTALS, MAGNETIC MOMENTS, LATTICES, QUANTUM MECHANICS, *BRILLOUIN ZONES, SOLID STATE PHYSICS.) (PHYSICAL PROPERTIES, SURFACE PROPERTIES, OXYGE, MAGNESIUM COMPOUNDS, FLUORIDES, OXIDES.) (MOLECULAR ROTATION, FERROMAGNETISM, MAGNETOSTRICTION.) (IONS, PERTURBATION THEORY, VECTOR ANALYSIS, OPERATORS (MATHEMATICS), ALGEBRA, THEORY, FUNCTIONS, TABLES.)

*BROMIDES

AD-271 393 64-2-2 DIV. 25
ILLINOIS U., URBANA.
DESCRIPTORS: (*SILVER COMPOUNDS, *BROMIDES, *CHLORIDES, CRYSTALS, ELECTRONS, MAGNETIC FIELDS, *MAGNETIC EFFECTS, *CONDUCTIVITY, PHOTOELECTRONS, RESISTANCE.) (THEORY, SEMICONDUCTORS, METALS, PHOTOCONDUCTIVITY, HALL EFFECT.) TEST METHODS, TEST EQUIPMENT, *HALIDES.

*BURNS

AD-270 948 64-2-2 DIV. 16
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
DESCRIPTORS: (*THERMAL RADIATION, GAS FLOW, AIR, *SKIN, *BURNS, PROTECTIVE CLOTHING, CLOTHING, *COTTON TEXTILES, HEAT TRANSFER, RADIATION EFFECTS,) (TEST METHODS, TEST EQUIPMENT, CARBON ARC LAMPS, SKIN, SIMULATION, PLASTICS.)

*CADMIUM PLATING

AD-271 528 64-2-2 DIV. 17
DIRECTORATE OF MATERIALS AND PROCESSES, AERONAUTICAL SYSTEMS DIV., *WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: (*STEEL, AIRFRAMES, *CADMIUM PLATING,) (PROCESSING, HEAT TREATMENT, AUSTENITE, ELECTROPLATING, CADMIUM COMPOUNDS, FLUORIDES, BORATES, DIFFUSION, NICKEL ALLOYS, CADMIUM ALLOYS, VAPOR PLATING, CADMIUM.) (TESTS, TENSILE PROPERTIES, STRESSES, FRACTRE (MECHANICS), FATIGUE (MECHANICS), IMPACT SHOCK, MICROSTRUCTURE, MECHANICAL PROPERTIES.) ALLOYS.

*CANCER

AD-270 970 64-2-2 DIV. 16
BAYLOR U. COLL. OF MEDICINE, HOUSTON, TEX.
DESCRIPTORS: (*RADIATION EFFECTS, *METABOLISM, *IRON AND *HEMOPOIESIS,) (*CANCER CELLS (BIOLOGY), BLOOD, BIOCHEMICAL TESTS, ENZYME, DETECTION, THERAPY.)

*CANTILEVER BEAMS

AD-271 131 64-2-2 DIV. 25
MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*METALS, *CANTILEVER BEAMS, *FATIGUE (MECHANICS), *VIBRATION, *SHEAR STRESSES, LOADING, DEFORMATION, *LOAD DISTRIBUTION,) (TIME, MATERIALS, FREQUENCY, DAMPING, OSCILLATION,) (PROBABILITY, STATISTICAL DISTRIBUTIONS, STATISTICAL FUNCTIONS, HARMONIC ANALYSIS, STATISTICAL PROCESSES, GEOMETRY, INTEGRATION, DIFFERENTIAL EQUATIONS, INTEGRAL EQUATIONS, NUMERICAL ANALYSIS, SEQUENCES.)

*CAPACITORS

AD-271 060 64-2-2 DIV. 26
REPUBLIC AVIATION CORP., FARMINGDALE, N. Y.
DESCRIPTORS: (*CAPACITORS, *ELECTRIC DISCHARGES, *ELECTROFORMING, UNDERWATER EXPLOSIONS, SPARKS, SHOCK WAVES, PRESSURE, EXPLOSIVE FORMING, METALS,) (WAVE TRANSMISSION, LIQUIDS, PHYSICAL PROPERTIES, DENSITY, VISCOSITY, DIELECTRIC PROPERTIES, ACOUSTICS, VELOCITY,) (ALUMINUM TUBING, MECHANICAL PROPERTIES, TENSILE PROPERTIES, STRESSES.)

*CARBIDES

AD-271 580 64-2-2 DIV. 17
MANUFACTURING LABS., INC., CAMBRIDGE, MASS.
DESCRIPTORS: (HIGH PRESSURE RESEARCH, HIGH TEMPERATURE RESEARCH, METALLURGY, *PHASE STUDIES,) (HYDROSTATIC PRESSURE, PHASE TRANSITIONS, *IRON ALLOYS, CHROMIUM ALLOYS, NICKEL ALLOYS, SILICON ALLOYS,) (IRON ALLOYS, *CARBON ALLOYS, AUSTENITE,) (*MOLYBDENUM COMPOUNDS, *CARBIDES, SYNTHESIS,) (COPPER, *BRASS, MICROSTRUCTURE, STRESSES, REACTION KINETICS, RELAXATION TIME,) (*ALUMINUM COMPOUNDS, OXIDES, SINTERING,) (CERIUM, HALL EFFECT, MEASUREMENT,) BRITTLE MATERIALS, ALLOYS, METALS, TEST EQUIPMENT, X-RAY DIFFRACTION ANALYSIS.

*CARBON ALLOYS

AD-271 580 64-2-2 DIV. 17
MANUFACTURING LABS., INC., CAMBRIDGE, MASS.
DESCRIPTORS: (HIGH PRESSURE RESEARCH, HIGH TEMPERATURE RESEARCH, METALLURGY, *PHASE STUDIES,) (HYDROSTATIC PRESSURE, PHASE TRANSITIONS, *IRON ALLOYS, CHROMIUM ALLOYS, NICKEL ALLOYS, SILICON ALLOYS,) (IRON ALLOYS, *CARBON ALLOYS, AUSTENITE,) (*MOLYBDENUM COMPOUNDS, *CARBIDES, SYNTHESIS,) (COPPER, *BRASS, MICROSTRUCTURE, STRESSES, REACTION KINETICS, RELAXATION TIME,) (*ALUMINUM COMPOUNDS, OXIDES, SINTERING,) (CERIUM, HALL EFFECT, MEASUREMENT,) BRITTLE MATERIALS, ALLOYS, METALS, TEST EQUIPMENT, X-RAY DIFFRACTION ANALYSIS.

*CARBON COMPOUNDS

AD-270 987 64-2-2 DIV. 25
INSTITUTE FOR MOLECULAR PHYSICS, U. OF MARYLAND, COLLEGE PARK.
DESCRIPTORS: (*QUANTUM MECHANICS, ELECTRON TRANSITIONS, MOLECULES, IONS, *HYDRIDES, *BERYLLIUM COMPOUNDS, *CARBON COMPOUNDS, METHANES, ENERGY, THEORY, MATHEMATICAL ANALYSIS.)

*CARBON DIOXIDE

AD-271 116 64-2-2 DIV. 4
NAVAL RESEARCH LAB., WASHINGTON, D. C.
DESCRIPTORS: (LABORATORY EQUIPMENT, PRODUCTION, *OXYGEN BY ELECTROLYSIS, SULFURIC ACID AND CARBONATES, *CARBON DIOXIDE, ABSORPTION, DISPOSAL,) (ELECTROLYTIC CELLS, DESIGN,) AIR CONDITIONING, SUBMARINES.

AD-271 171 64-2-2 DIV. 25
AERONUTRONIC, NEWPORT BEACH, CALIF.
DESCRIPTORS: (*CARBON DIOXIDE, *RADIATION TOLERANCE, TRANSMISSION, BEHAVIOR,) (*FLAMES, INTENSITY, ABSORPTION,) (STATISTICAL ANALYSIS, TABLES.)

*CARBOXYLIC ACIDS

AD-271 596 64-2-2 DIV. 4
DIRECTORATE OF MATERIALS AND PROCESSES, AERONAUTICAL SYSTEMS DIV., *WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: (*FATTY ACIDS, ORGANIC ACIDS, *CARBOXYLIC ACIDS, FORMIC ACIDS, PROPIONIC ACIDS, OCTANOIC ACIDS, CAPRIC ACIDS, ACETIC ACIDS, VALERIC ACIDS, X-RAY DIFFRACTION ANAYSIS, CRYSTAL STRUCTURE, CRYSTALS, MOLECULES, THERMAL EXPANSION,) (ORGANIC ACIDS, BUTANES, HEPTANES, HEXANES, OCTANES,) (SOLIDS, LIQUIDS, MIXTURES.)

*CARGO

AD-271 585 64-2-2 DIV. 33
CALIFORNIA U., LOS ANGELES.
DESCRIPTORS: (*CARGO, *HANDLING, *RECORDS, STATISTICAL ANALYSIS,) (DATA PROCESSING SYSTEM, DIGITAL COMPUTERS.)

*CARGO SHIPS

AD-271 369 64-2-2 DIV. 31
SPERRY GYROSCOPE CO., SYOSSET, N. Y.
DESCRIPTORS: (NAVAL VESSELS, *CARGO SHIPS, *MANEUVERABILITY, ACCELERATION, DECELERATION, INERTIAL GUIDANCE, INSTRUMENTATION,) (TESTS, VELOCITY, SHIP HULLS, STABILITY, MATHEMATICAL ANALYSIS.)

*CARGO VEHICLES

AD-271 610 64-2-2 DIV. 11
CONTINENTAL ARMY COMMAND, FORT MONROE, VA.
DESCRIPTORS: (MOBILE, *RECOVERY VEHICLES, *CARGO VEHICLES, DESIGN, FEASIBILITY STUDIES FOR MILITARY OPERATIONS AND ARMY OPERATIONS,) (*VEHICLES, AIR TRANSPORTATION, RAILROADS, MAINTENANCE VEHICLES, MAINTENANCE TOOLS, MILITARY TRANSPORTATION, TRACKED VEHICLES, MAINTENANCE.)

*CATHODES (ELECTROLYTIC CELL)

AD-271 180 64-2-2 DIV. 7
NATIONAL CARBON CO., INC., CLEVELAND, OHIO.
DESCRIPTORS: (FEASIBILITY STUDIES, *PRIMARY BATTERIES, *POWER SUPPLIES,) (PULSE HEIGHT ANALYZERS, SCINTILLATION COUNTERS, RADIOACTIVITY, SILVER COMPOUNDS, CHLORIDES, POTASSIUM COMPOUNDS, LITHIUM COMPOUNDS, CHLORIDES,) (*CATHODES (ELECTROLYTIC CELL), COPPER COMPOUNDS, SULFIDES, IRON COMPOUNDS, SULFIDES, DEGASIFICATION.)

*CELESTIAL MECHANICS

AD-271 524 64-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*DIFFERENTIAL EQUATIONS, CONTROL SYSTEMS,) USSR, *CELESTIAL MECHANICS.

*CENTRIFUGE SEPARATION

AD-271 466 64-2-2 DIV. 10
LITTLE, ARTHUR D., CAMBRIDGE, MASS.
DESCRIPTORS: (*JET ENGINE FUELS, AVIATION FUELS, ROCKET FUELS, *LIQUID ROCKET PROPELLANTS, CONTAMINATION, IMPURITIES, WATER, SOLIDS, PARTICLES, PURIFICATION, SEPARATION, TESTS,) (FUEL FILTERS, *CENTRIFUGE SEPARATION, *ELECTROSTATIC PRECIPITATION.)

*CERAMIC CAPACITORS

AD-270 988 64-2-2 DIV. 7
SPRAGUE ELECTRIC CO., NORTH ADAMS, MASS.
DESCRIPTORS: (*CERAMIC CAPACITORS, *SUBMINIATURE ELECTRICAL EQUIPMENT, MATERIALS, *MANUFACTURING METHODS, PRODUCTION,) (CAPACITORS, CERAMIC MATERIALS, POWDERS, DIELECTRICS, SPRAYS, COATINGS, BINDERS,)

*CERAMIC COATINGS

AD-271 166 64-2-2 DIV. 1
BOEING CO., *WICHITA, KANSAS.
DESCRIPTORS: (*AIRFRAMES, *MATERIALS, *METALS, *ALLOYS, TITANIUM ALLOYS, EXTRUSION, *CERAMIC COATINGS, *REFRACTORY COATINGS, FLAME SPRAYING, SEALING COMPOUNDS, ELASTOMERS, *PLASTICS, EXPANDED PLASTICS, *ADHESIVES, RESIN ADHESIVES, SANDWICH CONSTRUCTION, HONEYCOMB CORES,

LAMINATES, NOSES.) (MECHANICAL PROPERTIES, TENSILE PROPERTIES, CLIMATIC FACTORS, FAILURE (MECHANICS), HIGH TEMPERATURE RESEARCH.) (POLYMERS, FLUORIDES, FLUOROCARBONS, SILICONES, SILANES, URETHANES, PYRIMIDINES.)

AD-271 384 64-2-2 DIV. 14
DEFENSE METALS INFORMATION CENTER, COLUMBUS, OHIO.
DESCRIPTORS: (HIGH TEMPERATURE RESEARCH, *CERAMIC COATINGS AS *OXIDATION INHIBITORS FOR *REFRACTORY MATERIALS, *HEAT RESISTANT ALLOYS, METALS, MOLYBDENUM, MOLYBDENUM ALLOYS, NIOBIUM ALLOYS, TANTALUM ALLOYS, TUNGSTEN ALLOYS, VANADIUM ALLOYS,) (COATINGS OF SILICIDES, ALUMINUM COMPOUNDS, OXIDES, CERMETS, INTERMETALLIC COMPOUNDS, METAL COATINGS, BERYLLIUM COMPOUNDS,) (PROCESSING BY ELECTRODEPOSITION, CHEMICAL REACTIONS, DIFFUSION, FLAME SPRAYING,) (RE-ENTRY VEHICLES, SATELLITES, SPACESHIPS, GLIDERS, STRUCTURES, TURBOJET ENGINES, RAMJET ENGINES, ROCKET MOTORS, NUCLEAR PROPULSION,)

*CERAMIC MATERIALS

AD-271 183 64-2-2 DIV. 14
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*DIELECTRICS, DIELECTRIC PROPERTIES, HIGH TEMPERATURE RESEARCH, VERY HIGH FREQUENCY, RADOMES, *MISSILE WINDOWS,) (*CERAMIC MATERIALS, *ALUMINUM COMPOUNDS, *OXIDES, REINFORCING MATERIALS, *PLASTICS, RESONANCE, TEST METHODS,)

AD-271 385 64-2-2 DIV. 25
CARBORUNDUM CO., NIAGARA FALLS, N. Y.
DESCRIPTORS: (*SINGLE CRYSTALS, *CERAMIC MATERIALS, *MAGNESIUM COMPOUNDS, OXIDES, SILICON COMPOUNDS, CARBIDES, PREPARATION, GROWTH, MECHANICAL PROPERTIES, TESTS,) (FRACTURE (MECHANICS), HIGH TEMPERATURE RESEARCH, STRESSES, DEFORMATION, SHEAR STRESSES, PLASTIC FLOW,) (ULTRASONICS, CUTTING TOOLS, TEST EQUIPMENT,)

AD-271 588 64-2-2 DIV. 8
MARCO INDUSTRIES, INC., SAN DIEGO, CALIF.
DESCRIPTORS: (*RADOMES, AIRBORNE, *CERAMIC MATERIALS, *ALUMINUM COMPOUNDS, *OXIDES, BONDING, *BRAZING, *ADHESIVES, HIGH TEMPERATURE RESEARCH,) (REFRACTORY MATERIALS, MOLYBDENUM ALLOYS, DIFFUSION, NICKEL, PLATINUM ALLOYS, PALLADIUM ALLOYS, GOLD ALLOYS, IRIDIUM ALLOYS, RHENIUM ALLOYS,) (COATINGS, MOLYBDENUM, FLAME SPRAYING, PLASMA JETS,) (METAL JOINTS, MICROSTRUCTURE,) EPOXY RESINS.

*CHEMICAL BONDS

AD-271 563 64-2-2 DIV. 30
LUND U. (SWEDEN).
DESCRIPTORS: (*PHOTOLYSIS, ORGANIC SOLVENTS, METHYL RADICALS, PENTANES, CARBON COMPOUNDS, SULFIDES, ETHYL RADICALS, IODIDES,) (*SPECTROPHOTOMETERS, DESIGN, LOW TEMPERATURE RESEARCH, *THERMOCHEMISTRY, *CHEMICAL BONDS, *RECOMBINATION REACTIONS, *FREE RADICALS,) SWEDEN.

*CHEMICAL INDICATORS

AD-271 001 64-2-2 DIV. 10
NAVAL RESEARCH LAB., WASHINGTON, D. C.
DESCRIPTORS: (*FUEL STORAGE TANKS AND *PROPELLANT TANKS FOR LIQUID ROCKET PROPELLANTS AND ROCKET OXIDIZERS, STORAGE, HAZARDS, RELIABILITY,) (*PAINTS, COATINGS, *CHEMICAL INDICATORS,) NAVAL VESSELS.

*CHEMICAL MILLING

AD-271 536 64-2-2 DIV. 26
DOUGLAS AIRCRAFT CO., INC., LONG BEACH, CALIF.
DESCRIPTORS: (*ALLOYS, AND *METALS FOR AIRCRAFT, MATERIALS AND STRUCTURES, PRODUCTION BY *CHEMICAL MILLING, GELS, CARBOXYMETHYLCELLULOSE, POROUS MATERIALS, SOLIDS, SOLUTIONS CHEMICALS,) (PROCESSING, STEEL, STAINLESS STEEL, NICKEL ALLOYS, TITANIUM ALLOYS, VANADIUM ALLOYS, CHROMIUM ALLOYS, ALUMINUM ALLOYS, *REFRACTORY MATERIALS, HEAT RESISTANT ALLOYS, MOLYBDENUM ALLOYS, TITANIUM ALLOYS, TANTALUM, NIOBIUM,)

*CHEMICAL REACTIONS

AD-271 590 64-2-2 DIV. 4
UNIVERSITY OF SOUTHERN CALIF., LOS ANGELES.
DESCRIPTORS: (*CHEMICAL REACTIONS, REACTION KINETICS, *FREE RADICALS, *BIBLIOGRAPHY,) (OZONE, ORGANIC HALIDES, ALKYL RADICALS, HYDROGEN COMPOUNDS, ACETYL RADICALS, IODIDES, PROPANES, IODINE, PEROXIDES, BUTYL RADICALS, ACETONES, METHYL RADICALS, ETHERS,) (DECOMPOSITION, PHOTOLYSIS, PYROLYSIS,)

*CHLORIDES

AD-271 303 64-2-2 DIV. 25
ILLINOIS U., URBANA.
DESCRIPTORS: (*SILVER COMPOUNDS, *BROMIDES, *CHLORIDES, CRYSTALS, ELECTRONS, MAGNETIC FIELDS, *MAGNETIC EFFECTS, *CONDUCTIVITY, PHOTOELECTRONS, RESISTANCE,) (THEORY, SEMICONDUCTORS, METALS, PHOTOCONDUCTIVITY, HALL EFFECT,) TEST METHODS, TEST EQUIPMENT, *HALIDES.

AD-271 421 64-2-2 DIV. 25
GEORGIA INST. OF TECH., ENGINEERING EXPERIMENT STATION, ATLANTA.
DESCRIPTORS: (*CRYSTALS, SINGLE CRYSTALS, *ALUMINUM, *SILVER COMPOUNDS, *SODIUM COMPOUNDS, *CHLORIDES, X-RAY DIFFRACTION ANALYSIS, CRYSTAL STRUCTURE, TEMPERATURE, HIGH TEMPERATURE RESEARCH, THERMAL EXPANSION, THERMAL DIFFUSION, THEORY,) (TEST METHODS, TEST EQUIPMENT, X-RAY FILTERS,)

*CHROMIUM

AD-271 457 64-2-2 DIV. 14
ROCK ISLAND ARSENAL LAB., ILL.
DESCRIPTORS: (STEEL, *CHROMIUM PLATING, *CHROMIUM, ELECTROCHEMISTRY, OXIDATION, ANODES (ELECTROLYTIC CELLS), *COATINGS, *METAL COATINGS, METAL FILMS, CHROMIUM COMPOUNDS, OXIDES, CORROSION INHIBITION, MECHANICAL PROPERTIES, CAMOUFLAGE,) (MANUFACTURING METHODS, SOLUTIONS, CHROMIC ACID, SODIUM COMPOUNDS, HYDROXIDES, SULFITES,)

*CHROMIUM ALLOYS

AD-271 571 64-2-2 DIV. 17
MICHIGAN U., ANN ARBOR.
DESCRIPTORS: (*HEAT RESISTANT ALLOYS, ALLOYS, *NICKEL ALLOYS, *COBALT ALLOYS, *CHROMIUM ALLOYS, MOLYBDENUM ALLOYS, *CREEP EFFECTS MECHANICAL PROPERTIES, MICROSTRUCTURE, PHASE STUDIES,) (HIGH TEMPERATURE RESEARCH, TEST, HARDNESS, TENSILE PROPERTIES, IMPACT SHOCK, RUPTURE, DEFORMATION, SURFACE PROPERTIES, HEAT TREATMENT,) (X-RAY DIFFRACTION ANALYSIS, ELECTRON DIFFRACTION ANALYSIS, ELECTRON MICROSCOPY, MICROSCOPY, EXTENSOMETERS, DILATOMETERS, THERMOCOUPLES,)

*CHROMIUM PLATING

AD-271 457 64-2-2 DIV. 14
ROCK ISLAND ARSENAL LAB., ILL.
DESCRIPTORS: (STEEL, *CHROMIUM PLATING, *CHROMIUM, ELECTROCHEMISTRY, OXIDATION, ANODES (ELECTROLYTIC CELLS), *COATINGS, *METAL COATINGS, METAL FILMS, CHROMIUM COMPOUNDS, OXIDES, CORROSION INHIBITION, MECHANICAL PROPERTIES, CAMOUFLAGE,) (MANUFACTURING METHODS, SOLUTIONS, CHROMIC ACID, SODIUM COMPOUNDS, HYDROXIDES, SULFITES,)

*CIVIL AVIATION

AD-271 452 64-2-2 DIV. 2
BORG-WARNER CONTROLS DIV., BORG-WARNER COMP., SANTA ANA, CALIF.
DESCRIPTORS: (*CIVIL AVIATION, ALL WEATHER AVIATION, *CLIMATIC FACTORS, METEOROLOGY, METEOROLOGICAL DATA, *AIR TRAFFIC CONTROL SYSTEMS,)

AD-271 453 64-2-2 DIV. 2
BORG-WARNER CONTROLS DIV., BORG-WARNER COMP., SANTA ANA, CALIF.
DESCRIPTORS: (*CIVIL AVIATION, ALL WEATHER AVIATION, *CLIMATIC FACTORS, METEOROLOGY, METEOROLOGICAL DATA, AIR TRAFFIC CONTROL SYSTEMS,)

AD-271 537 64-2-2 DIV. 2
BORG-WARNER CONTROLS DIV., BORG-WARNER COMP., SANTA ANA, CALIF.
DESCRIPTORS: (*CIVIL AVIATION, ALL WEATHER AVIATION, *CLIMATIC FACTORS, METEOROLOGY, METEOROLOGICAL DATA, AIR TRAFFIC CONTROL SYSTEMS,)

AD-271 557 64-2-2 DIV. 2
BORG-WARNER CONTROLS DIV., BORG-WARNER COMP., SANTA ANA, CALIF.
DESCRIPTORS: (*CIVIL AVIATION, ALL WEATHER AVIATION, *CLIMATIC FACTORS, METEOROLOGY, METEOROLOGICAL DATA, AIR TRAFFIC CONTROL SYSTEMS,)

AD-271 558 64-2-2 DIV. 2
BORG-WARNER CONTROLS DIV., BORG-WARNER COMP., SANTA ANA, CALIF.
DESCRIPTORS: *CIVIL AVIATION, ALL WEATHER AVIATION, *CLIMATIC FACTORS, METEOROLOGY, METEOROLOGICAL DATA, AIR TRAFFIC CONTROL SYSTEMS.

*CIVILIAN DEFENSE SYSTEMS

AD-271 466 64-2-2 DIV. 18
OPERATIONS RESEARCH OFFICE, JOHNS HOPKINS U., BETHESDA, MD.
DESCRIPTORS: (*OPERATIONS RESEARCH, *CIVILAN DEFENSE SYSTEMS, FOREIGN POLICY, *MILITARY GOVERNMENT,)

*CLIMATE

AD-271 014 64-2-2 DIV. 2
IR WEATHER SERVICE, SCOTT AIR FORCE BASE, ILL.
DESCRIPTORS: (*GEORGIA, AIRPORTS, AIR FORCE OPERATIONS, *CLIMATE, WEATHER FORCASTING, HANDBOOKS,)

AD-271 544 64-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*CLIMATE, ARCTIC REGIONS,) (OCEAN CURRENTS, ICE, MELTING, CLIMATIC FACTORS,) (THEORY, USSR,)

*CLIMATIC FACTORS

AD-271 452 64-2-2 DIV. 2
BORG-WARNER CONTROLS DIV., BORG-WARNER COMP., SANTA ANA, CALIF.
DESCRIPTORS: (*CIVIL AVIATION, ALL WEATHER AVIATION, *CLIMATIC FACTORS, METEOROLOGY, METEOROLOGICAL DATA, *AIR TRAFFIC CONTROL SYSTEMS,)

AD-271 453 64-2-2 DIV. 2
BORG-WARNER CONTROLS DIV., BORG-WARNER COMP., SANTA ANA, CALIF.
DESCRIPTORS: (*CIVIL AVIATION, ALL WEATHER AVIATION, *CLIMATIC FACTORS, METEOROLOGY, METEOROLOGICAL DATA, AIR TRAFFIC CONTROL SYSTEMS,)

AD-271 537 64-2-2 DIV. 2
BORG-WARNER CONTROLS DIV., BORG-WARNER COMP., SANTA ANA, CALIF.
DESCRIPTORS: (*CIVIL AVIATION, ALL WEATHER AVIATION, *CLIMATIC FACTORS, METEOROLOGY, METEOROLOGICAL DATA, AIR TRAFFIC CONTROL SYSTEMS,)

AD-271 557 64-2-2 DIV. 2
BORG-WARNER CONTROLS DIV., BORG-WARNER COMP., SANTA ANA, CALIF.
DESCRIPTORS: (*CIVIL AVIATION, ALL WEATHER AVIATION, *CLIMATIC FACTORS, METEOROLOGY, METEOROLOGICAL DATA, AIR TRAFFIC CONTROL SYSTEMS,)

AD-271 558 64-2-2 DIV. 2
BORG-WARNER CONTROLS DIV., BORG-WARNER COMP., SANTA ANA, CALIF.
DESCRIPTORS: *CIVIL AVIATION, ALL WEATHER AVIATION, *CLIMATIC FACTORS, METEOROLOGY, METEOROLOGICAL DATA, AIR TRAFFIC CONTROL SYSTEMS.

*CLOUDS

AD-271 541 64-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*CLOUDS, REDUCTION, USSR,) (SOLAR ECLIPSE, *VISIBILITY, CLIMATIC FACTORS,) (AIRCRAFT, FLIGHT PATHS, CARBON DIOXIDE, TESTS,) ARTIFICIAL PRECIPITATION.

*COATINGS

AD-271 457 64-2-2 DIV. 14
ROCK ISLAND ARSENAL LAB., ILL.
DESCRIPTORS: (STEEL, *CHROMIUM PLATING, *CHROMIUM, ELECTROCHEMISTRY, OXIDATION, ANODES (ELECTROLYTIC CELLS), *COATINGS, *METAL COATINGS, METAL FILMS, CHROMIUM COMPOUNDS, OXIDES, CORROSION INHIBITION, MECHANICAL PROPERTIES, CAMOUFLAGE,) (MANUFACTURING METHODS, SOLUTIONS, CHROMIC ACID, SODIUM COMPOUNDS, HYDROXIDES, SULFITES,)

*COBALT ALLOYS

AD-271 480 64-2-2 DIV. 17
MICHIGAN U., ANN ARBOR
DESCRIPTORS: (*NICKEL ALLOYS, *COBALT ALLOYS, CHROMIUM ALLOYS, MOLYBDENUM ALLOYS, TITANIUM ALLOYS, ALUMINUM ALLOYS, *CREEP ON MECHANICL PROPERTIES AND MICROSTRUCTURE,) (TEST EQUIPMENT, HEATING, STRAIN GAGES, EXTENSOMETERS, DEFORMATION, LOAD DISTRIBUTION, IMPACT SHOCK, MICROSCOPY, ELECTRON MICROSCOPY, X-RAY DIFFRACTION ANALYSIS,) (HIGH TEMPERATURE RESEARCH, THERMAL STRESSES, TIME, GRAINS (METALLURGY), CRYSTAL STRUCTURE, PHASE TRANSITIONS, CARBIDES, TEMPERATURE, PLASTIC FLOW, HARDENING, RUPTURE,) ALLOYS.

AD-271 571 64-2-2 DIV. 17
MICHIGAN U., ANN ARBOR.
DESCRIPTORS: (*HEAT RESISTANT ALLOYS, ALLOYS, *NICKEL ALLOYS, *COBALT ALLOYS, *CHROMIUM ALLOYS, MOLYBDENUM ALLOYS, *CREEP EFFECTS MECHANICAL PROPERTIE, MICROSTRUCTURE, PHASE STUDIES,) (HIGH TEMPERATURE RESEARCH, TEST, HARDNESS, TENSILE PROPERTIES, IMPACT SHOCK, RUPTURE, DEFORMATION, SURFACE PROPERTIES, HEAT TREATMENT,) (X-RAY DIFFRACTION ANALYSIS, ELECTRON DIFFRACTION ANALYSIS, ELECTRON MICROSCOPY, MICROSCOPY, EXTENSOMETERS, DILATOMETERS, THERMOCOUPLES,)

*COBALT COMPOUNDS

AD-271 559 64-2-2 DIV. 25
RADIATION LAB., JOHNS HOPKINS U., BALTIMORE, MD.
DESCRIPTORS: (*PARAMAGNETIC CRYSTALS, PARAMAGNETIC SALTS, *POTASSIUM COMPOUNDS, COBALT COMPOUNDS, *IRON COMPOUNDS, *CYANIDES, *RELAXATION TIME, NUCLEAR SPINS, TEMPERATURE, LOW TEMPERATURE RESEARCH, SPECTROGRAPHIC ANALYSIS, *PARAMAGNETIC RESONANCE, THEORY,) MASERS.

*CODING

AD-271 063 64-2-2 DIV. 30
ELECTRONICS RESEARCH LAB., U. OF CALIF., BERKELEY.
DESCRIPTORS: (*ERRORS, *DETECTION, *CODING,) (DIGITAL SYSTEMS, DATA TRANSMISSION SYSTEMS, INFORMATION THEORY,)

*COLLIMATORS

AD-271 090 64-2-2 DIV. 30
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*RANGE, SIMULATION, *OPTICAL EQUIPMENT.) (BINOCULARS, TELESCOPES, TEST EQUIPMENT.) *COLLIMATORS.

*COLLOIDS

AD-271 102 64-2-2 DIV. 25
GEORGIA INST. OF TECH. ENGINEERING EXPERIMENT STATION, ATLANTA.
DESCRIPTORS: (*THERMAL CONDUCTIVITY, PARTICLES, *COLLOIDS, EXPERIMENTAL DATA.) (COLLOIDS, GELS.) (GREASES, ZINC, ALUMINUM.)

*COLORIMETRY

AD-271 983 64-2-2 DIV. 16
NAVAL MEDICAL RESEARCH LAB., NEW LONDON, CONN.
DESCRIPTORS: (*GLUCOSE, *ANTHRONES, REAGENTS, *COLORIMETRY, PHOTOELECTRIC CELLS, MEASUREMENT.) *BODY FLUIDS.

*COMBINATORIAL ANALYSIS

AD-271 612 64-2-2 DIV. 9
MONTANA STATE COLL., BOZEMAN.
DESCRIPTORS: (*SWITCHING CIRCUITS, *COMMUNICATION SYSTEMS, STATISTICAL PROCESSES, GROUPS (MATHEMATICS), TRANSFORMATIONS (MATHEMATICS), SEQUENTIAL ANALYSIS, MATHEMATICAL LOGIC, ANALYSIS, SYNTHESIS, *COMBINATORIAL ANALYSIS, TRANSIENTS.)

*COMBUSTION

AD-270 929 64-2-2 DIV. 10
ATLANTIC RESEARCH CORP., ALEXANDRIA, VA.
DESCRIPTORS: (*SOLID ROCKET PROPELLANTS, *ROCKET OXIDIZERS, *COMBUSTION, IGNITION, REACTION KINETICS, FLAMES, FLAME PROPAGATION, PRESSURE, THEORY, DECOMPOSITION, THERMOCHEMISTRY.) (*PERCHLORIC ACIDS, VAPORS, CHEMICAL REACTIONS, AMMONIA.) (AMMONIUM RADICALS, POTASSIUM COMPOUNDS, *PERCHLORATES AND METHANES, MIXTURES OF BINDERS, POLYMERS, VINYLCHLORIDES, CARBOXYLIC ACIDS.)

AD-271 128 64-2-2 DIV. 10
STANFORD RESEARCH INST., MENLO PARK, CALIF.
DESCRIPTORS: (INHIBITION OF *COMBUSTION, FLAME PROPAGATION, *PROPELLANTS, HYDROCARBONS BY HALOGEN COMPOUNDS, METALS, POWDER METALS) (VAPORIZATION, SURFACE AREA, PARTICLES, ABSORPTION, SPECIFIC HEAT.) (PHOSPHORUS COMPOUNDS, SULFUR COMPOUNDS, BORON COMPOUNDS, FLUORIDES, BROMIDES, CHLORIDES, HALIDES, OXYCHLORIDES.) (CALCIUM COMPOUNDS, SODIUM COMPOUNDS, POTASSIUM COMPOUNDS, CARBONATES.) METHANES.

AD-271 461 64-2-2 DIV. 10
FOREST SERVICE, WASHINGTON, D. C.
DESCRIPTORS: (FLUID FLOW, *HEAT TRANSFER, GASES, COMBUSTION, THERMAL CONDUCTIVITY.) (*COMBUSTION, CONVECTION, CONDUCTIVITY.) (ATMOSPHERE, STABILITY.) FOREST FIRES, PARTIAL DIFFERENTIAL EQUATIONS.

*COMMUNICATION SYSTEMS

AD-271 111 64-2-2 DIV. 5
NATIONAL CASH REGISTER CO., DAYTON, OHIO.
DESCRIPTORS: (*COMMUNICATION SYSTEMS, HIGH FREQUENCY, *RADIO COMMUNICATION SYSTEMS, *DIGITAL SYSTEMS, AIRBORNE, GROUND SUPPORT EQUIPMENT, DESIGN.) (DATA TRANSMISSION SYSTEMS, SYNCHRONIZERS, BAND-PASS FILTERS, RADIO-FREQUENCY FILTERS, SIGNAL-TO-NOISE RATIO, PIEZOELECTRIC CRYSTALS, CRYSTAL FILTERS, AUTOMATIC VOLUME CONTROL.) (DIGITAL COMPUTERS, CIRCUITS, TRIGGER CIRCUITS, ELECTRONIC CIRCUITS, SYNTHESIS, TESTS, RELIABILITY.)

AD-271 548 64-2-2 DIV. 30
FARRINGTON ELECTRONICS, INC., ALEXANDRIA, VA.
DESCRIPTORS: (*READING MACHINES, OPTICAL EQUIPMENT, *COMMUNICATION SYSTEMS, TELETYPE SYSTEMS, DATA TRANSMISSION SYSTEMS, EFFECTIVENESS, ERRORS, DESIGN, TESTS, ANALYSIS.)

AD-271 549 64-2-2 DIV. 5
LABORATORIES FOR RESEARCH AND DEVELOPMENT, FRANKLIN INST., PHILADELPHIA, PA.
DESCRIPTORS: (*COMMUNICATION SYSTEMS, *MILITARY COMMUNICATIONS, *OPERATIONS RESEARCH, COLLECTING METHODS, DATA, MILITARY ORGANIZATIONS, INFORMATION THEORY.) (HUMAN ENGINEERING, ERRORS, RELIABILITY.)

AD-271 612 64-2-2 DIV. 9
MONTANA STATE COLL., BOZEMAN.
DESCRIPTORS: (*SWITCHING CIRCUITS, *COMMUNICATION SYSTEMS, STATISTICAL PROCESSES, GROUPS (MATHEMATICS), TRANSFORMATIONS (MATHEMATICS), SEQUENTIAL ANALYSIS, MATHEMATICAL LOGIC, ANALYSIS, SYNTHESIS, *COMBINATORIAL ANALYSIS, TRANSIENTS.)

*COMPUTERS

AD-270 942 64-2-2 DIV. 30
STANFORD RESEARCH INST., MENLO PARK, CALIF.
DESCRIPTORS: (*DATA PROCESSING SYSTEMS, *DATA STORAGE SYSTEMS, DOCUMENTATION.) (*COMPUTERS, COSTS, ANALYSIS.)

*CONDUCTIVITY

AD-271 393 64-2-2 DIV. 25
ILLINOIS U., URBANA.
DESCRIPTORS: (*SILVER COMPOUNDS, *BROMIDES, *CHLORIDES, CRYSTALS, ELECTRONS, MAGNETIC FIELDS, *MAGNETIC EFFECTS, *CONDUCTIVITY, PHOTOELECTRONS, RESISTANCE.) (THEORY, SEMICONDUCTORS, METALS, PHOTOCONDUCTIVITY, HALL EFFECT.) TEST METHODS, TEST EQUIPMENT, *HALIDES.

*CONICAL BODIES

AD-271 018 64-2-2 DIV. 9
BOEING SCIENTIFIC RESEARCH LABS., SEATTLE, WASH.
DESCRIPTORS: (*SUPERSONIC FLOW, WAVE ANALYSIS *TRANSFORMATIONS (MATHEMATICS), SWEPT-FORWAD WINGS, *CONICAL BODIES.) (DIFFERENTIAL EQUATIONS, DIFFERENTIAL GEOMETRY, PARTIAL DIFFERENTIAL EQUATIONS.)

*CONTAINERS

AD-271 034 64-2-2 DIV. 27
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*BIBLIOGRAPHY, *MATERIALS, METALS, *CONTAINERS, *LIQUID ROCKET PROPELLANTS, LIQUEFIED GASES,) (HYDROGEN, FLUORINE, HYDRAZINES, NITROGEN COMPOUNDS, TETROXIDES.)

AD-271 193 64-2-2 DIV. 12
OGDEN AIR MATERIAL AREA, HILL AIR FORCE BASE, UTAH.
DESCRIPTORS: (*GUIDED MISSILES, AIR TO AIR, *ROCKET MOTORS, SHIPPING, *CONTAINERS, IMPACT SHOCK, TESTS, HANDLING, PRESSURE.)

AD-271 475 64-2-2 DIV. 29
*WHIRLPOOL CORP., ST. JOSEPH, MICH.
DESCRIPTORS: (*CONTAINERS, FOOD, STORAGE, PREPARATION, SPACE FLIGHT, *FEEDING.) DESIGN, PRODUCTION, TESTS.

*CONTROL SYSTEMS

AD-271 522 64-2-2 DIV. 26
APPLIED MATHEMATICS AND STATISTICS LABS., STANFORD U., CALIF.
DESCRIPTORS: (MONITORS, *DETERIORATION, STORAGE, *SUPPLIES, *CONTROL SYSTEMS,) (MANAGEMENT ENGINEERING, SUPPLY DEPOTS, TEMPERATURE, CORROSION, HUMIDITY, MAINTENANCE.)

AD-271 542 64-2-2 DIV. 12
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: SUBSTITUTES FOR GYROSCOPES IN *INERTIAL GUIDANCE, *INERTIAL NAVIGATION, *GUIDANCE, *CONTROL SYSTEMS, USSR.

*COOLING FANS

AD-271 394 64-2-2 DIV. 13
IMC MAGNETICS CORP., WESTBURY, LONG ISLAND, N. Y.
DESCRIPTORS: (ELECTRIC MOTORS, BLOWERS, *AIR CONDITIONING EQUIPMENT, *COOLING FANS FOR SHIPBORNE, ELECTRONIC EQUIPMENT.) MILITARY REQUIREMENTS, SPECIFICATIONS, DESIGN, TESTS, DIELECTRIC PROPERTIES, RADIO INTERFERENCE, VIBRATION, IMPACT SHOCK, TEMPERATURE, HUMIDITY.

*CORROSION

AD-271 081 64-2-2 DIV. 17
AEROJET-GENERAL CORP., AZUSA, CALIF.
DESCRIPTORS: (*HEAT RESISTANT ALLOYS, STEEL, STAINLESS STEEL, TITANIUM ALLOYS, VANADIUM ALLOYS, CHROMIUM ALLOYS, *CORROSION, *STRESES, FRACTURE (MECHANICS), FAILURE (MECHANICS).) (ROCKET CASES, MATERIALS, CORROSION INHIBITION, *CORROSION RESEARCH, CORROSIVE LIQUIDS, CORROSIVE GASES.) ALLOYS.

AD-271 128 64-2-2 DIV. 17
VIRGINIA INST. FOR SCIENTIFIC RESEARCH, RICHMOND.
DESCRIPTORS: (METALS, *ALUMINUM, *CORROSION, OXIDATION, AIR, MERCURY COMPOUNDS, IODIDES, HUMIDITY.) (*CORROSION RESEARCH, TEST METHODS, OXIDES, X-RAY DIFFRACTION ANALYSIS.) (CORROSIVE LIQUIDS, SALTS, PHOSPHATES, CHLORIDES, NITRATES, SULFATES, BROMIDES, CHROMATES.)

*CORROSION RESEARCH

AD-271 081 64-2-2 DIV. 17
AEROJET-GENERAL CORP., AZUSA, CALIF.
DESCRIPTORS: (*HEAT RESISTANT ALLOYS, STEEL, STAINLESS STEEL, TITANIUM ALLOYS, VANADIUM ALLOYS, CHROMIUM ALLOYS, *CORROSION, *STRESES, FRACTURE (MECHANICS), FAILURE (MECHANICS).) (ROCKET CASES, MATERIALS, CORROSION INHIBITION, *CORROSION RESEARCH, CORROSIVE LIQUIDS, CORROSIVE GASES.) ALLOYS.

AD-271 128 64-2-2 DIV. 17
VIRGINIA INST. FOR SCIENTIFIC RESEARCH, RICHMOND.
DESCRIPTORS: (METALS, *ALUMINUM, *CORROSION, OXIDATION, AIR, MERCURY COMPOUNDS, IODIDES, HUMIDITY.) (*CORROSION RESEARCH, TEST METHODS, OXIDES, X-RAY DIFFRACTION ANALYSIS.) (CORROSIVE LIQUIDS, SALTS, PHOSPHATES, CHLORIDES, NITRATES, SULFATES, BROMIDES, CHROMATES.)

*COSMIC RAYS

AD-271 512 64-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*IONOSPHERE, IONIZATION,) (*AURORAE, NIGHT SKY, LUMINESCENCE.) (*SOLAR CORONA, SOLAR FLARES, POLARIZATION,) VAN ALLEN RADIATION BELT, *COSMIC RAYS, *ATMOSPHERIC ELECTRICITY, *PLASMA PHYSICS.

AD-271 515 64-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*SUNSPOTS, HYDRODYNAMICS,) (SUNSPOTS, THEORY,) (IONOSPHERIC DISTURBANCES, SOLAR FLARES,) (*IONOSPHERE, IONIZATION,) (IONOSPHERE, TERRESTRIAL MAGNETISM,) (*AURORAE, ANTARCTIC REGIONS,) (AURORAE, MEASUREMENT, RADAR, PHOTOMETERS, SPECTROGRAPHIC ANALYSIS, PHOTOGRAPHIC ANALYSIS,) (*EARTH, *ELECTRIC CURRENTS,) SOLAR ATMOSPHERE, *COSMIC RAYS, *ATMOSPHERIC ELECTRICITY.

*COTTON TEXTILES

AD-270 948 64-2-2 DIV. 16
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN,
DESCRIPTORS: (*THERMAL RADIATION, GAS FLOW, AIR, *SKIN, *BURNS, PROTECTIVE CLOTHING, CLOTHING, *COTTON TEXTILES, HEAT TRANSFER, RADIATION EFFECTS,) (TEST METHODS, TEST EQUIPMENT, CARBON ARC LAMPS, SKIN, SIMULATION, PLASTICS,)

*CRATERING

AD-270 930 64-2-2 DIV. 22
BUREAU OF MINES, PITTSBURGH, PA.
DESCRIPTORS: (*HYPERVELOCITY PROJECTILES, AMMUNITION FRAGMENTS, PARTICLES, HYPERSONICS, TERMINAL BALLISTICS, EFFECTIVENESS, ALUMINUM ALLOYS, ALLOYS, METAL PLATES, SHEETS, FAILURE (MECHANICS), *PENETRATION, *CRATERING, SPALLATION.) (ANALYSIS OF CRATERING OF HYPERVELOCITY PROJECTILES.) (TEST EQUIPMENT FOR ACCELERATION OF HYPERVELOCITY PROJECTILS, DESIGN.)

*CREEP

AD-271 478 64-2-2 DIV. 17
RESEARCH INST., U. OF MICHIGAN, ANN ARBOR.
DESCRIPTORS: (*NICKEL, *NIOBIUM, *CREEP, DEFORMATION, LATTICES, HARDENING, *CRYSTAL STRUCTURE, HEAT TREATMENT, ROLLING MILLS,) (TEST METHODS, PREPARATION, ELECTROLYTIC POLISHING, PHASE TRANSITIONS, HEAT OF FUSION, MELTING, ELECTRON GUNS, GRAINS (METALLURGY), RUPTURE, MICROSTRUCTURE, X-RAY DIFFRACTION ANALYSIS,) METALS.

AD-271 480 64-2-2 DIV. 17
MICHIGAN U., ANN ARBOR
DESCRIPTORS: (*NICKEL ALLOYS, *COBALT ALLOYS, CHROMIUM ALLOYS, MOLYBDENUM ALLOYS, TITANIUM ALLOYS, ALUMINUM ALLOYS, *CREEP ON MECHANICL PROPERTIES AND MICROSTRUCTURE,) (TEST EQUIPMENT, HEATING, STRAIN GAGES, EXTENSOMETERS, DEFORMATION, LOAD DISTRIBUTION, IMPACT SHOCK, MICROSCOPY, ELECTRON MICROSCOPY, X-RAY DIFFRACTION ANALYSIS,) (HIGH TEMPERATURE RESEARCH, THERMAL STRESSES, TIME, GRAINS (METALLURGY), CRYSTAL STRUCTURE, PHASE TRANSITIONS, CARBIDES, TEMPERATURE, PLASTIC FLOW, HARDENING, RUPTURE,) ALLOYS.

AD-271 571 64-2-2 DIV. 17
MICHIGAN U., ANN ARBOR,
DESCRIPTORS: (*HEAT RESISTANT ALLOYS, ALLOYS, *NICKEL ALLOYS, *COBALT ALLOYS, *CHROMIUM ALLOYS, MOLYBDENUM ALLOYS, *CREEP EFFECTS MECHANICAL PROPERTIE, MICROSTRUCTURE, PHASE STUDIES,) (HIGH TEMPERATURE RESEARCH, TEST, HARDNESS, TENSILE PROPERTIES, IMPACT SHOCK, RUPTURE, DEFORMATION, SURFACE PROPERTIES, HEAT TREATMENT,) (X-RAY DIFFRACTION ANALYSIS, ELECTRON DIFFRACTION ANALYSIS, ELECTRON MICHOSCOPY, MICROSCOPY, EXTENSOMETERS, DILATOMETERS, THERMOCOUPLES,)

*CRYOGENICS

AD-271 000 64-2-2 DIV. 25
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: (*CRYOGENICS, *LOW TEMPERATURE RESEARCH, *SUPERCONDUCTIVITY, THERMODYNAMICS, TRANSPORT PROPERTIES,) (ROCKET FUELS, LIQUID ROCKET PROPELLANTS, ROCKET OXIDIZERS, LIQUEFIED GASES, FLUORINE, HYDROGEN, OXYGEN, NITROGEN, OZONE,) (HAZARDS, HANDLING, STORAGE,) (GUIDED MISSILES, SURFACE TO SURFACE, SATELLITE VEHICLES,) (MATERIALS, ADHESIVES, SEALS, ELASTOMERS, LUBRICANTS, ALLOYS, ALUMINUM ALLOYS, COPPER ALLOYS, MAGNESIUM ALLOYS, MOLYBDENUM ALLOYS, NICKEL ALLOYS, STEEL, STAINLESS STEEL, TITANIUM ALLOYS,) (COMPUTERS, MEMORY DEVICES, DIGITAL COMPUTERS,) *BIBLIOGRAPHY, GYROSCOPES, INSTRUMENTATION.

*CRYSTAL HOLDERS

AD-271 561 64-2-4 DIV. 26
KNIGHTS, JAMES, CO., SANDWICH, ILL.
DESCRIPTORS: (*CRYSTAL OSCILLATORS, QUARTZ CRYSTALS, GLASS SEALS, VACUUM SEALS, *SEALS, *CRYSTAL HOLDERS, *HEATING ELEMENTS, MANUFACTURING METHODS,) MINIATURE ELECTRONIC EQUIPMENT.

*CRYSTAL OSCILLATORS

AD-270 995 64-2-4 DIV. 8
NEW YORK U. COLL. OF ENGINEERING, N. Y.
DESCRIPTORS: (*CRYSTAL OSCILLATORS, PHASE

MODULATION; FREQUENCY MODULATION; *NOISE (RADIO); STATISTICAL ANALYSIS; MATHEMATICAL ANALYSIS.) (OSCILLATORS; RADIOFREQUENCY FILTERS; RADIOFREQUENCY; STABILITY; SIGNAL-TO-NOISE RATIO; PHASE STUDIES; CORRELATION TECHNIQUES.) (FREQUENCY ANALYZERS; NOISE ANALYZERS.)

AD-271 561 62-2-2 DIV. 26
KNIGHTS; JAMES; CO., SANDWICH; ILL.
DESCRIPTORS: (*CRYSTAL OSCILLATORS; QUARTZ CRYSTALS; GLASS SEALS; VACUUM SEALS; *SEALS; *CRYSTAL HOLDERS; *HEATING ELEMENTS; MANUFACTURING METHODS.) MINIATURE ELECTRONIC EQUIPMENT.

AD-271 627 62-2-2 DIV. 8
DAVID SARNOFF RESEARCH CENTER; PRINCETON; N. .
DESCRIPTORS: (*CRYSTAL OSCILLATORS; ELECTRIC FIELDS; MAGNETIC FIELDS; TESTS; DESIGN.) (OSCILLATION; THEORY; MATHEMATICAL ANALYSIS) (*OSCILLATORS; CRYSTALS; GERMANIUM; SEMICONDUCTORS; SURFACE PROPERTIES.)

*CRYSTAL OVENS

AD-271 413 62-2-2 DIV. 8
*WHIRLPOOL CORP.; ST. JOSEPH; MICH.
DESCRIPTORS: (*CRYSTAL OVENS; RADIOFREQUENCY; FREQUENCY; STANDARDS; FREQUENCY STABILIZERS; *THERMOELECTRICITY; *TEMPERATURE CONTROL; HEAT EXCHANGERS; CRYSTALS; DESIGN; INSTALLATION; TESTS.)

*CRYSTAL STRUCTURE

AD-271 392 62-2-2 DIV. 25
ILLINOIS U.; URBANA.
DESCRIPTORS: (*ALKALI METAL COMPOUNDS; *HALIDES; *CRYSTALS; *CRYSTAL STRUCTURE; EXCITATION; PHOTOCONDUCTIVITY; MEASUREMENT.) (FLUORESCENCE; LUMINESCENCE; LIFE EXPECTANCY; PULSE HEIGHT ANALYZERS; L BAND; RELAXATION TIME.) (POTASSIUM COMPOUNDS; CHLORIDES; BROMIDES; IODIDES.)

AD-271 478 62-2-2 DIV. 17
RESEARCH INST.; U. OF MICHIGAN; ANN ARBOR.
DESCRIPTORS: (*NICKEL; *NIOBIUM; *CREEP; DEFORMATION; LATTICES; HARDENING; *CRYSTAL STRUCTURE; HEAT TREATMENT; ROLLING MILLS.) (TEST METHODS; PREPARATION; ELECTROLYTIC POLISHING; PHASE TRANSITIONS; HEAT OF FUSION; MELTING; ELECTRON GUNS; GRAINS (METALLURGY); RUPTURE; MICROSTRUCTURE; X-RAY DIFFRACTION ANALYSIS.) METALS.

*CRYSTALLIZATION

AD-271 123 62-2-2 DIV. 17
RUTGERS U. COLL. OF ENGINEERING; NEW BRUNSWIC; N. J.
DESCRIPTORS: (*ALUMINUM; *CRYSTALS; GRAINS (METALLURGY); *CRYSTALLIZATION; GROWTH; DEFORMATION; LATTICES; MICROSTRUCTURE; ELECTRON MICROSCOPY; X-RAY DIFFRACTION ANALYSIS.) METALS.

*CRYSTALS

AD-271 123 62-2-2 DIV. 17
RUTGERS U. COLL. OF ENGINEERING; NEW BRUNSWIC; N. J.
DESCRIPTORS: (*ALUMINUM; *CRYSTALS; GRAINS (METALLURGY); *CRYSTALLIZATION; GROWTH; DEFORMATION; LATTICES; MICROSTRUCTURE; ELECTRON MICROSCOPY; X-RAY DIFFRACTION ANALYSIS.) METALS.

AD-271 392 62-2-2 DIV. 25
ILLINOIS U.; URBANA.
DESCRIPTORS: (*ALKALI METAL COMPOUNDS; *HALIDES; *CRYSTALS; *CRYSTAL STRUCTURE; EXCITATION; PHOTOCONDUCTIVITY; MEASUREMENT.) (FLUORESCENCE; LUMINESCENCE; LIFE EXPECTANCY; PULSE HEIGHT ANALYZERS; L BAND; RELAXATION TIME.) (POTASSIUM COMPOUNDS; CHLORIDES; BROMIDES; IODIDES.)

AD-271 421 62-2-2 DIV. 25
GEORGIA INST. OF TECH.; ENGINEERING EXPERIMENT STATION; ATLANTA.
DESCRIPTORS: (*CRYSTALS; SINGLE CRYSTALS; *ALUMINUM; *SILVER COMPOUNDS; *SODIUM COMPOUNDS; *CHLORIDES; X-RAY DIFFRACTION ANALYSIS; CRYSTAL STRUCTURE; TEMPERATURE; HIGH TEMPERATURE RESEARCH; THERMAL EXPANSION; THERMAL DIFFUSION; THEORY.) (TEST METHODS; TEST EQUIPMENT; X-RAY FILTERS.)

AD-271 644 62-2-2 DIV. 25
SLOANE PHYSICS LAB.; YALE U.; NEW HAVEN; CONN
DESCRIPTORS: (*CRYSTALS; CRYSTAL STRUCTURE; MAGNETIC PROPERTIES; PARAMAGNETIC CRYSTALS; MAGNETIC MOMENTS; LATTICES; QUANTUM MECHANICS; *BRILLOUIN ZONES; SOLID STATE PHYSICS.) (PHYSICAL PROPERTIES; SURFACE PROPERTIES; OXYGE; MAGNESIUM COMPOUNDS; FLUORIDES; OXIDES.) (MOLECULAR ROTATION; FERROMAGNETISM; MAGNETOSTRICTION.) (IONS; PERTURBATION THEORY; VECTOR ANALYSIS; OPERATORS (MATHEMATICS); ALGEBRA; THEORY; FUNCTIONS; TABLES.)

*CYANIDES

AD-271 599 62-2-2 DIV. 25
RADIATION LAB.; JOHNS HOPKINS U.; BALTIMORE; MD.
DESCRIPTORS: (*PARAMAGNETIC CRYSTALS; PARAMAGNETIC SALTS; *POTASSIUM COMPOUNDS; COBALT COMPOUNDS; *IRON COMPOUNDS; *CYANIDES; *RELAXATION TIME; NUCLEAR SPINS; TEMPERATURE; LOW TEMPERATURE RESEARCH; SPECTROGRAPHIC ANALYSIS; *PARAMAGNETIC RESONANCE. THEORY.) MASERS.

*CYLINDRICAL BODIES

AD-270 926 62-2-2 DIV. 27
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION; WASHINGTON; D. C.
DESCRIPTORS: (*CYLINDRICAL BODIES; COATING; *METAL FILM; *IONS; ELECTROSTATICS; ANALYSIS; *ELECTRIC PROPULSION; ROCKET MOTORS.) (CESIUM; VAPORS; IONIZATION) (PLATINUM; TANTLUM; WIRE; HEATING; DENSITY; SPACE CHARGES.) (DIFFERENTIAL EQUATIONS; INTEGRAL EQUATIONS.) ION SOURCES.

AD-270 989 62-2-2 DIV. 9
GIANNINI SCIENTIFIC CORP.; SANTA ANA; CALIF.
DESCRIPTORS: (*GAS DISCHARGES; IONIZATION; *DISCHARGE TUBES; *CYLINDRICAL BODIES; COILS.) (INSTRUMENTATION; CAPACITORS; SWITCHES; TRIGGER CIRCUITS; TRANSMISSION LINES.) (PHOTOGRAPHIC ANALYSIS; SCHLIEREN PHOTOGRAPHY; OSCILLOGRAMS; ARGON; AIR.)

AD-271 471 62-2-2 DIV. 25
BROWN U. DIV. OF APPLIED MATHEMATICS; PROVIDENCE; R. I.
DESCRIPTORS: (*CYLINDRICAL BODIES; ROTATION; ELASTICITY; *STRESSES; VISCOSITY.) (BOUNDARY LAYER; *FLUID FLOW; SURFACES.)

AD-271 550 62-2-2 DIV. 22
GENERAL TECHNOLOGY CORP.; ELGIN; ILL.
DESCRIPTORS: (*CYLINDRICAL BODIES; *EXPLOSIVES; *PROJECTILES; MECHANICAL PROPERTIES; STRESSES; *HIGH EXPLOSIVE AMMUNITION; DEFORMATION; DESIGN; TEST METHODS; DIGITAL COMPUTERS.) (CYLINDRICAL BODIES; STRESSES; MEASUREMENT; ROTATING BANDS.)

AD-271 631 62-2-2 DIV. 25
ISRAEL INST. OF TECH.; HAIFA.
DESCRIPTORS: (*CYLINDRICAL BODIES; *SHEAR STRESSES; ELASTICITY; LOADING; DEFORMATION; FATIGUE (MECHANICS); BUCKLING; STABILITY; ANALYSIS.) (LINEAR SYSTEMS; THEORY; *DIFFERENTIAL EQUATIONS; GEOMETRY; POLYNOMIALS.)

*DAMPING

AD-271 572 62-2-2 DIV. 25
MINNESOTA U., MINNEAPOLIS.
DESCRIPTORS: (STRUCTURES, MATERIALS, *VIBRATION, HYSTERESIS, *DAMPING, THEORY, STRESSES, MATHEMATICAL ANALYSIS.) (DISKS, BEAMS, CYLINDRICAL BODIES, SPHERES, TESTS, DATA.) (METL PLATES, STEEL, BRASS, COPPER, MAGNESIUM ALLYS, NICKEL ALLOYS, CHROMIUM ALLOYS.) (MACHINES TURBINE BLADES, BALL BEARINGS, AIRPLANE PANELS.) APPLIED MECHANICS, ALLOYS.

*DATA PROCESSING SYSTEMS

AD-270 962 62-2-2 DIV. 30
STANFORD RESEARCH INST., MENLO PARK, CALIF.
DESCRIPTORS: (*DATA PROCESSING SYSTEMS, *DATA STORAGE SYSTEMS, DOCUMENTATION.) (*COMPUTERS, COSTS, ANALYSIS.)

AD-271 494 62-2-2 DIV. 6
DREXEL INST. OF TECH., PHILADELPHIA, PA.
DESCRIPTORS: (*MAGNETIC DETECTORS, *MINE DETECTORS, THEORY, SIGNAL-TO-NOISE RATIO, *ELECTRIC FILTERS, *DATA PROCESSING SYSTEMS, LINEAR PROGRAMMING, DIGITAL COMPUTERS, MINES, DETECTION, ERRORS.) (NUMERICAL METHODS AND PROCEDURES, INTEGRAL TRANSFORMS, CALCULUS OF VARIATIONS, MATRIX ALGEBRA, SPECIAL FUNCTIONS, PARTIAL DIFFERENTIAL EQUATIONS, INTEGRAL EQUATIONS, TAYLOR'S SERIES, OPERATORS (MATHEMATICS), ALGEBRA, GEOMETRY.)

AD-271 600 62-2-2 DIV. 32
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: (*DOCUMENTATION, *DATA PROCESSING SYSTEMS, LANGUAGE, MATHEMATICAL ANALYSIS, ALGEBRA, THEORY.)

*DATA STORAGE SYSTEMS

AD-270 962 62-2-2 DIV. 30
STANFORD RESEARCH INST., MENLO PARK, CALIF.
DESCRIPTORS: (*DATA PROCESSING SYSTEMS, *DATA STORAGE SYSTEMS, DOCUMENTATION.) (*COMPUTERS, COSTS, ANALYSIS.)

*DECOMPRESSION

AD-271 011 62-2-2 DIV. 30
NAVY EXPERIMENTAL DIVING UNIT, NAVAL WEAPONS PLANT, WASHINGTON, D. C.
DESCRIPTORS: (*DECOMPRESSION, *DIVING, DESIGN, TEST METHOD, MEASUREMENT.) (NITROGEN, OXYGEN.)

*DEHYDRATED SUBSTANCES

AD-271 381 62-2-2 DIV. 29
NAVAL SUPPLY RESEARCH AND DEVELOPMENT FACILITY, BAYONNE, N. J.
DESCRIPTORS: (*DEHYDRATED SUBSTANCES, *MILITARY RATIONS, *POTATOES, COSTS, STORAGE.)

*DELAY LINES

AD-271 422 62-2-2 DIV. 25
GENERAL ELECTRIC CO., SYRACUSE, N. Y.
DESCRIPTORS: (*DELAY LINES, MICROWAVE FREQUENCY, *MICROWAVE EQUIPMENT, *SOLID STATE PHYSICS.) (ACOUSTICS, *SOLID DELAY LINES, *MAGNETOSTRICTIVE ELEMENTS, TRANSDUCERS, MAGNETOSTRICTION TRANSDUCERS.) (MICROWAVES, PROPAGATION, SINGLE CRYSTALS, SILICON, GERMANIUM, HYPERSONICS, ATTENUATION.) (PIEZOELECTRIC EFFECT, QUARTZ CRYSTALS, X BAND, WAVEGUIDES.) (BONDING, SEMICONDUCTORS, SILICONES, GREASES, CRYOGENICS, THIN FILMS.)

*DENTAL CARIES

AD-271 086 62-2-2 DIV. 16
DENTAL RESEARCH FACILITY, NAVAL TRAINING CENTER, GREAT LAKES, ILL.
DESCRIPTORS: (*SALIVA, *INFRARED SPECTROSCOPY, MAN, ABSORPTION, MEASUREMENT, IMMUNIZATION.) (*DENTAL PLAQUES, *DENTAL CARIES, CHEMICAL ANALYSIS.)

*DETECTION

AD-271 063 62-2-2 DIV. 30
ELECTRONICS RESEARCH LAB., U. OF CALIF., BERKELEY.
DESCRIPTORS: (*ERRORS, *DETECTION, *CODING.) (DIGITAL SYSTEMS, DATA TRANSMISSION SYSTEMS, INFORMATION THEORY.)

AD-271 186 62-2-2 DIV. 6
MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*DETECTION OF *UNDERGROUND EXPLOSIONS, *NUCLEAR EXPLOSIONS WITH DIGITAL COMPUTERS FROM DATA ON EARTHQUAKES.) (MAGNETIC RECORDING SYSTEMS, DIGITAL RECORDING SYSTEMS, DIGITAL SYSTEMS, SEISMIC WAVES.)

*DETERIORATION

AD-271 522 62-2-2 DIV. 26
APPLIED MATHEMATICS AND STATISTICS LABS., STANFORD U., CALIF.
DESCRIPTORS: (MONITORS, *DETERIORATION, STORAGE, *SUPPLIES, *CONTROL SYSTEMS.) (MANAGEMENT ENGINEERING, SUPPLY DEPOTS, TEMPERATURE, CORROSION, HUMIDITY, MAINTENANCE.)

*DIELECTRIC FILMS

AD-271 645 62-2-2 DIV. 8
ARMOUR RESEARCH FOUNDATION, CHICAGO, ILL.
DESCRIPTORS: (SEMICONDUCTORS, *THIN FILMS, *SEMICONDUCTING FILMS, *DIELECTRIC FILMS, *METAL FILMS, MANUFACTURING METHODS, CONDUCTIVITY, HALL EFFECT, DIELECTRIC PROPERTIES, ELECTRICAL PROPERTIES, CRYSTAL STRUCTURE, X-RAY DIFFRACTION ANALYSIS.) (METALLIC SMOKE DEPOSITS, SURFACES, METALS, LIQUID METALS.) (SILICON COMPOUNDS, TITANIUM COMPOUNDS, DIOXIDES, CARBIDES, BORIDES, BORON, BORON COMPOUNDS, PHOSPHIDES, MERCURY COMPOUNDS, SELENIDES, TELLURIDES, TITANIUM ALLOYS, COPPER ALLOYS, BONDING, ANTIOXIDANTS.)

*DIELECTRIC PROPERTIES

AD-271 121 62-2-2 DIV. 6
PRINCETON U., N. J.
DESCRIPTORS: (*ORGANIC COMPOUNDS, LIQUIDS, SOLIDS, *MOLECULAR STRUCTURE, *MOLECULAR ROTATION, RELAXATION TIME, MOLECULAR SPECTROSCOPY, *DIELECTRICS, *DIELECTRIC PROPERTIES, DIPOLE MOMENTS, VICOSITY, MECHANICAL PROPERTIES.) (ETHERS, AMINES, ALKOXY RADICALS, BENZENES, ALKYL RADICALS, HALIDES, QUINOLINES, QUINONES.) MICROWAVE SPECTROSCOPY.

*DIELECTRICS

AD-270 961 62-2-2 DIV. 14
PLASTICS LAB., PRINCETON U., N. J.
DESCRIPTORS: (*POLYMERS, *PLASTICS, *FERROCENES, *DIELECTRICS, *SEMICONDUCTORS, ORGANIC MATERIALS, DIELECTRIC PROPERTIES, ELECTRICAL PROPERTIES, CONDUCTIVITY, SYNTHESIS, MECHANICAL PROPERTIES, PHASE STUDIES, VISCOSITY, TEST METHODS, PRESSURE.) (POLYMERIZATION, ETHYLENES ORGANIC COMPOUNDS, VINYL RADICALS, ALLYL RADICALS.) (BUTADIENES, BUTENES, PROPENES.) METHODS, PRESSURE.) (POLYMERIZATION, ETHYLENES ORGANIC COMPOUNDS, VINYL RADICALS, ALLYL RADICALS.) (BUTADIENES, BUTENES, PROPENES.)

AD-271 121 62-2-2 DIV. 6
PRINCETON U., N. J.
DESCRIPTORS: (*ORGANIC COMPOUNDS, LIQUIDS, SOLIDS, *MOLECULAR STRUCTURE, *MOLECULAR ROTATION, RELAXATION TIME, MOLECULAR SPECTROSCOPY, *DIELECTRICS, *DIELECTRIC PROPERTIES, DIPOLE MOMENTS, VICOSITY, MECHANICAL PROPERTIES.) (ETHERS, AMINES, ALKOXY RADICALS, BENZENES, ALKYL RADICALS, HALIDES, QUINOLINES, QUINONES.) MICROWAVE SPECTROSCOPY.

AD-271 183 62-2-2 DIV. 14
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*DIELECTRICS, DIELECTRIC PROPERTIES, HIGH TEMPERATURE RESEARCH, VERY HIGH FREQUENCY, RADOMES, MISSILE WINDOWS.) (*CERAMIC MATERIALS, *ALUMINUM COMPOUNDS, *OXIDES, REINFORCING MATERIALS, *PLASTICS, RESONANCE, TEST METHODS.)

*DIFFERENTIAL EQUATIONS

AD-271 631 62-2-2 DIV. 25
ISRAEL INST. OF TECH., HAIFA.
DESCRIPTORS: (*CYLINDRICAL BODIES, *SHEAR STRESSES, ELASTICITY, LOADING, DEFORMATION, FATIGUE (MECHANICS), BUCKLING, STABILITY, ANALYSIS.) (LINEAR SYSTEMS, THEORY, *DIFFERENTIAL EQUATIONS, GEOMETRY, POLYNOMIALS.)

*DIGITAL SYSTEMS

AD-271 111 62-2-2 DIV. 5
NATIONAL CASH REGISTER CO., DAYTON, OHIO.
DESCRIPTORS: (*COMMUNICATION SYSTEMS, HIGH FREQUENCY, *RADIO COMMUNICATION SYSTEMS, *DIGITAL SYSTEMS, AIRBORNE, GROUND SUPPORT EQUIPMENT, DESIGN.) (DATA TRANSMISSION SYSTEMS, SYNCHRONIZERS, BAND-PASS FILTERS, RADIO-FREQUENCY FILTERS, SIGNAL-TO-NOISE RATIO, PIEZOELECTRIC CRYSTALS, CRYSTAL FILTERS, AUTOMATIC VOLUME CONTROL.) (DIGITAL COMPUTERS, CIRCUITS, TRIGGER CIRCUITS, ELECTRONIC CIRCUITS, SYNTHESIS, TESTS, RELIABILITY.)

*DIODES

AD-271 078 62-2-2 DIV. 8
ANTI-SUBMARINE WARFARE LAB., NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA.
DESCRIPTORS: (*DIODES, *TRANSISTORS, PREAMPLIFIERS, *RADIO RECEIVERS, *TRANSISTOR APPLIFIERS, SEMICONDUCTORS, AMPLITUDE MODULATION, FREQUENCY MODULATION, AIRBORNE, VERY HIGH FREQUENCY, *RADIO SONO BUOYS, THEORY, DESIGN.) (CIRCUITS, ELECTRONIC CIRCUITS, APPLIFIERS.)

AD-271 179 62-2-2 DIV. 8
ELECTRICAL ENGINEERING RESEARCH LAB., U. OF ILLINOIS, URBANA.
DESCRIPTORS: (*ELECTRICAL NETWORKS, *DIODES, LINEAR SYSTEMS, IMPEDANCE, SYNTHESIS, FUNCTIONS, THEORY.)

AD-271 633 62-2-2 DIV. 25
SYLVANIA ELECTRIC PRODUCTS, INC., WOBURN, MASS.
DESCRIPTORS: (*DIODES, SILICON COMPOUNDS, SILANES, CHLORIDES, DIFFUSION, VAPORS, DEPOSITS, *THIN FILMS, TEMPERATURE, *SILICON, CRYSTALS, *SINGLE CRYSTALS, GROWTH, THICKNESS, RESISTANCE.) (CHEMICAL IMPURITIES, PHOSPHORUS, BORON COMPOUNDS, BROMIDES.) GASES, ARGON.

*DIPOLE ANTENNAS

AD-271 378 62-2-2 DIV. 8
APPLIED PHYSICS LAB., JOHNS HOPKINS U., SILVER SPRING, MD.
DESCRIPTORS: (*SATELLITE VEHICLE ANTENNAS, *DIPOLE ANTENNAS, THEORY.) (*ANTENNAS, ELECTRIC FIELDS, *ANTENNA RADIATION PATTERNS, MATHEMATICAL ANALYSIS.)

*DIRECTION FINDING

AD-271 531 62-2-2 DIV. 6
ELECTRICAL ENGINEERING RESEARCH LAB., U. OF ILLINOIS, URBANA.
DESCRIPTORS: (*DIRECTION FINDING, MEDIUM FREQUENCY, HIGH FREQUENCY, VERY HIGH FREQUENCY, *RADIO RECEIVERS, ANTENNAS, DOPPLER SYSTEMS, RADIO EQUIPMENT, DESIGN, TESTS.) (RADIO WAVES, ICNOSPHERIC PROPAGATION, PHASE MEASUREMENT.)

AD-271 584 62-2-2 DIV. 6
DIAMOND ORDNANCE FUZE LABS., WASHINGTON, D. C
DESCRIPTORS: (*DIRECTION FINDING, POSITION FINDING, *RADAR TRANSMITTERS, RADAR INTERCEPTION, RADAR REFLECTIONS, RADAR PULSES, ANGLE OF ARRIVAL, PULSE ANALYZERS, THEORY, ERRORS, FEASIBILITY STUDIES.)

*DISCHARGE TUBES

AD-270 989 62-2-2 DIV. 9
GIANNINI SCIENTIFIC CORP., SANTA ANA, CALIF.
DESCRIPTORS: (*GAS DISCHARGES, IONIZATION, *DISCHARGE TUBES, *CYLINDRICAL BODIES, COILS.) (INSTRUMENTATION, CAPACITORS, SWITCHES, TRIGGER CIRCUITS, TRANSMISSION LINES.) (PHOTOGRAPHIC ANALYSIS, SCHLIEREN PHOTOGRAPHY, OSCILLOGRAMS, ARGON, AIR.)

*DISPLAY SYSTEMS

AD-270 938 62-2-2 DIV. 28
GEORGIA U., ATHENS.
DESCRIPTORS: (*PSYCHOLOGY, *VISUAL PERCEPTION, BEHAVIOR, THEORY, *PSYCHOMETRICS, CONDITIONED REFLEX, LEARNING.) (MATRIX ALGEBRA, MATHEMATICAL PREDICTION, PROBABILITY.) (*DISPLAY SYSTEMS, TARGET RECOGNITION, INTELLIGIBILITY.)

AD-271 440 62-2-2 DIV. 10
HRB SINGER, INC., STATE COLLEGE, PA.
DESCRIPTORS: (*AERIAL RECONNAISSANCE, *DISPLAY SYSTEMS, DATA PROCESSING SYSTEMS, INFORMATION THEORY, COMBAT INFORMATION CENTERS, AIR CONTROL CENTERS, *HUMAN ENGINEERING, DESIGN.) (RADAR EQUIPMENT, TARGETS, TARGET RECOGNITION, CODING BY COLORS, CONFIGURATION.)

AD-271 626 62-2-2 DIV. 6
STRAZA INDUSTRIES, EL CAJON, CALIF.
DESCRIPTORS: (*DISPLAY SYSTEMS, *SONAR, SONAR EQUIPMENT, OPTICAL FILTERS, LUMINESCECE, BRIGHTNESS, SOLID STATE PHYSICS, *PHOTOCONDUCTIVITY, THIN FILMS, MATERIALS, COATINGS, DESIGN, TEST EQUIPMENT, PRODUCTION, TIN COMPOUNDS, OXIDES.)

*DIVING

AD-271 011 62-2-2 DIV. 30
NAVY EXPERIMENTAL DIVING UNIT, NAVAL WEAPONS PLANT, WASHINGTON, D. C.
DESCRIPTORS: (*DECOMPRESSION, *DIVING, DESIGN, TEST METHOD, MEASUREMENT.) (NITROGEN, OXYGEN.)

*DOCUMENTATION

AD-271 600 62-2-2 DIV. 32
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: (*DOCUMENTATION, *DATA PROCESSING SYSTEMS, LANGUAGE, MATHEMATICAL ANALYSIS, ALGEBRA, THEORY.)

*DOPPLER NAVIGATION

AD-271 382 62-2-2 DIV. 12
APPLIED PHYSICS LAB., JOHNS HOPKINS U., SILVER SPRING, MD.
DESCRIPTORS: (SATELLITE VEHICLES, NAVIGATION, *DOPPLER NAVIGATION, DOPPLER SYSTEMS, SATELLITE VEHICLE ANTENNAS, RADIO TRANSMITTERS, DATA STORAGE SYSTEMS, INSTRUMENTATION, DESIGN, CONFIGURATION, POWER SUPPLIES, THERMAL INSULATION, FLIGHT TESTING, RELIABILITY, EFFECTIVENESS.)

*EAR

AD-271 031 62-2-2 DIV. 16
HARVARD U., DIV. OF ENGINEERING AND APPLIED PHYSICS, CAMBRIDGE, MASS.
DESCRIPTORS: (BIRDS, *BIRD NAVIGATION, PSYCHOACOUSTICS, HEARING, SOUND, MEASUREMENT, POSITION FINDING, THEORY.) (*EAR, ANATOMY, SENSITIVITY TO FREQUENCY.)

*EARTH

AD-271 515 62-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*SUNSPOTS, HYDRODYNAMICS.) (SUNSPOTS, THEORY.) (IONOSPHERIC DISTURBANCES, SOLAR FLARES.) (*IONOSPHERE, IONIZATION.)

(IONOSPHERE, TERRESTRIAL MAGNETISM.) (*AURORAE ANTARCTIC REGIONS.) (AURORAE, MEASUREMENT, RADAR, PHOTOMETERS, SPECTROGRAPHIC ANALYSIS, PHOTOGRAPHIC ANALYSIS.) (*EARTH, *ELECTRIC CURRENTS.) SOLAR ATMOSPHERE, *COSMIC RAYS, *ATMOSPHERIC ELECTRICITY.

*EARTHQUAKES

AD-271 513 62-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*EARTHQUAKES, CLASSIFICATION, *SEISMIC WAVES, ATTENUATION, NOMOGRAPHS.)

*ECONOMICS

AD-271 013 62-2-2 DIV. 32
CALIFORNIA U., BERKELEY.
DESCRIPTORSO (*ECONOMICS, COSTS.) (STATISTICAL ANALYSIS, SPECIAL FUNCTIONS, *MANAGEMENT ENGINEERING.)

*EDUCATION

AD-271 130 62-2-2 DIV. 23
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: *TEACHING MACHINES, *BIBLIOGRAPHY, *TRAINING DEVICES, *LEARNING, *EDUCATION, *MILITARY TRAINING.

*EJECTION SEATS

AD-271 613 62-2-2 DIV. 1
GENERAL DYNAMICS/FORT WORTH, TEX.
DESCRIPTORS: (*ACCELERATION, GRAVITY, THRUST, BODY, ANTHROPOMETRY, AVIATION PERSONNEL.) (*AVIATION SAFETY, *BAILOUT, *EJECTION SEAT, DESIGN, TEST METHODS, SAFETY HARNESS, COCKPITS, CATAPULTS.)

*ELASTICITY

AD-271 534 62-2-2 DIV. 25
BROWN U. DIV. OF APPLIED MATHEMATICS, PROVIDENCE, R. I.
DESCRIPTORS: (*ELASTICITY, VISCOSITY, *SOLIDS, *LINEAR SYSTEMS, STRESSES, DEFORMATION.) (MATHEMATICAL ANALYSIS, STRESSES, PARTIAL DIFFERENTIAL EQUATIONS.)

*ELECTRIC CONNECTORS

AD-271 428 62-2-2 DIV. 8
AERONAUTICAL ELECTRONIC AND ELECTRICAL LAB., NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA.
DESCRIPTORS: (*ELECTRIC CONNECTORS, BERYLLIUM ALLOYS, COPPER ALLOYS, SILVER ALLOYS, GOLD PLATING, TIN COATINGS, ELECTRONIC EQUIPMENTFOR AIRCRAFT.) TESTS, DIELECTRIC PROPERTIES, RESISTANCE, HUMIDITY, VIBRATION.

*ELECTRIC DISCHARGES

AD-271 060 62-2-2 DIV. 26
REPUBLIC AVIATION CORP., FARMINGDALE, N. Y.
DESCRIPTORS: (*CAPACITORS, *ELECTRIC DISCHARGES, *ELECTROFORMING, UNDERWATER EXPLOSIONS, SPARKS, SHOCK WAVES, PRESSURE, EXPLOSIVE FORMING, METALS.) (WAVE TRANSMISSION, LIQUIDS, PHYSICAL PROPERTIES, DENSITY, VISCOSITY, DIELECTRIC PROPERTIES, ACOUSTICS, VELOCITY.) (ALUMINUM TUBING, MECHANICAL PROPERTIES, TENSILE PROPERTIES, STRESSES.)

AD-271 423 62-2-2 DIV. 8
GIANNINI SCIENTIFIC CORP., SANTA ANA, CALIF.
DESCRIPTORS: (*GASES, *ELECTRIC DISCHARGES, GAS DISCHARGES, *GAS IONIZATION, THERMONUCLAR REACTIONS, MAGNETIC FIELDS, *PLASMA PHYSICS, HYDROGEN, ARGON.) (DISCHARGE TUBES, INSTRUMENTATION.) (ELECTRONS, DIFFUSION.)

AD-271 426 62-2-2 DIV. 8
GIANNINI SCIENTIFIC CORP., SANTA ANA, CALIF.
DESCRIPTORS: (*GASES, *ELECTRIC DISCHARGES, GAS DISCHARGES, *GAS IONIZATION, THERMONUCLEAR REACTIONS, MAGNETIC FIELDS, *PLASMA PHYSICS, HYDROGEN, ARGON.) (INSTRUMENTATION, OSCILLOSCOPES, PHOTOMULTIPLIERS, PHOTOGRAPHY.)

*ELECTRIC FILTERS

AD-271 454 62-2-2 DIV. 6
DREXEL INST. OF TECH., PHILADELPHIA, PA.
DESCRIPTORS: (*MAGNETIC DETECTORS, *NINE DETECTORS, THEORY, SIGNAL-TO-NOISE RATIO, *ELECTRIC FILTERS, *DATA PROCESSING SYSTEMS, LINEAR PROGRAMMING, DIGITAL COMPUTERS, PINES, DETECTION, ERRORS.) (NUMERICAL METHODS AND PROCEDURES, INTEGRAL TRANSFORMS, CALCULUS OF VARIATIONS, MATRIX ALGEBRA, SPECIAL FUNCTIONS, PARTIAL DIFFERENTIAL EQUATIONS, INTEGRAL EQUATIONS, TAYLOR'S SERIES, OPERATORS (MATHEMATICS), ALGEBRA, GEOMETRY.)

*ELECTRIC FUZES

AD-271 598 62-2-2 DIV. 3
AIR FORCE PROVING GROUND COMMAND, EGLIN AIR FORCE BASE, FLA.
DESCRIPTORS: (*FIRE BOMBS, *INCENDIARY BOMBS, *BOMB FUZES, *ELECTRIC FUZES, PROCESSING, LOADING, RELIABILITY, FLIGHT TESTING, SAFETY, TEMPERATURE, PRESSURE, TESTS.)

*ELECTRIC PROPULSION

AD-270 926 62-2-2 DIV. 27
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*CYLINDRICAL BODIES, COATING, *METAL FILM, *IONS, ELECTROSTATICS, ANALYSIS, *ELECTRIC PROPULSION, ROCKET MOTORS.) (CESIUM, VAPORS, IONIZATION) (PLATINUM, TANTLUM, WIRE, HEATING, DENSITY, SPACE CHARGES.) (DIFFERENTIAL EQUATIONS, INTEGRAL EQUATIONS.) ION SOURCES.

*ELECTRIC WELDING

AD-271 351 62-2-2 DIV. 26
HAMILTON STANDARD DIV., UNITED AIRCRAFT CORP., WINDSOR LOCKS, CONN.
DESCRIPTORS: (*TUNGSTEN, *MOLYBDENUM ALLOYS, SHEETS, *ELECTRIC WELDING, WELDING, ELECTRON BEAMS.) (WELDS, WELDED JOINTS, RADIOGRAPHIC ANALYSIS, METALLURGICAL ANALYSIS, MECHANICAL PROPERTIES, TENSILE PROPERTIES, SURFACE PROPERTIES, DEFORMATION, FRACTURE (MECHANICS), POROSITY, GRAINS (METALLURGY), MELTING, CRYSTALLIZATION.) (MACHINING, ELECTROEROSIVE MACHINING, PROCESSING.) METALS, ALLOYS.

*ELECTRICAL NETWORKS

AD-271 179 62-2-2 DIV. 8
ELECTRICAL ENGINEERING RESEARCH LAB., U. OF ILLINOIS, URBANA.
DESCRIPTORS: (*ELECTRICAL NETWORKS, *DIODES, LINEAR SYSTEMS, IMPEDANCE, SYNTHESIS, FUNCTIONS, THEORY.)

*ELECTROCARDIOGRAPHY

AD-271 160 62-2-2 DIV. 16
TEXAS U. MEDICAL BRANCH, GALVESTON.
DESCRIPTORS: (*PRIMATES, *ELECTROCARDIOGRAPHY, PHYSIOLOGY, TEST METHODS.)

*ELECTROFORMING

AD-271 060 62-2-2 DIV. 26
REPUBLIC AVIATION CORP., FARMINGDALE, N. Y.
DESCRIPTORS: (*CAPACITORS, *ELECTRIC DISCHARGES, *ELECTROFORMING, UNDERWATER EXPLOSIONS, SPARKS, SHOCK WAVES, PRESSURE, EXPLOSIVE FORMING, METALS.) (WAVE TRANSMISSION, LIQUIDS, PHYSICAL PROPERTIES, DENSITY, VISCOSITY, DIELECTRIC PROPERTIES, ACOUSTICS, VELOCITY.) (ALUMINUM TUBING, MECHANICAL PROPERTIES, TENSILE PROPERTIES, STRESSES.)

*ELECTROMAGNETIC THEORY

AD-271 010 62-2-2 DIV. 8
BROWN U., PROVIDENCE, R. I.
DESCRIPTORS: (*WAVEGUIDES, DIELECTRICS, ELECTROMAGNETIC PROPERTIES, *ELECTROMAGNETIC THEORY, WAVE TRANSMISSION, IMPEDANCE, HARMONIC ANALYSIS, OPERATORS (MATHEMATICS), TRANSFORMATIONS (MATHEMATICS), INTEGRAL TRANSFORMS.) (WAVEGUIDES, *ELECTROMAGNETIC WAVES, PROPAGATION, MATHEMATICAL ANALYSIS.)

*ELECTROMAGNETIC WAVE REFLECTIONS

AD-271 615 62-2-2 DIV. 8
GOETTINGEN U. (GERMANY).
DESCRIPTORS: (ELECTROMAGNETIC WAVES, *ELECTROMAGNETIC WAVE REFLECTIONS, *MICROWAVES, REFLECTION, EXTREMELY HIGH FREQUENCY, ABSORPTION, MATERIALS.) (MICROWAVES, *RESONANCE ABSORPTION, DIPOLE ANTENNAS.) PROPAGATION.

*ELECTROMAGNETIC WAVES

AD-271 010 62-2-2 DIV. 8
BROWN U., PROVIDENCE, R. I.
DESCRIPTORS: (*WAVEGUIDES, DIELECTRICS, ELECTROMAGNETIC PROPERTIES, *ELECTROMAGNETIC THEORY, WAVE TRANSMISSION, IMPEDANCE, HARMONIC ANALYSIS, OPERATORS (MATHEMATICS), TRANSFORMATIONS (MATHEMATICS), INTEGRAL TRANSFORMS.) (WAVEGUIDES, *ELECTROMAGNETIC WAVES, PROPAGATION, MATHEMATICAL ANALYSIS.)

*ELECTRON BEAMS

AD-271 177 62-2-2 DIV. 8
GENERAL ELECTRIC CO., SYRACUSE, N. Y.
DESCRIPTORS: (*KLYSTRONS, MICROWAVE EQUIPMENT, X BAND, *ELECTRON BEAMS, SPACE CHARGES, SECONDARY EMISSION, ELECTRONS, ELECTRODES.) ELECTRON TUBES.

AD-271 399 62-2-2 DIV. 8
LITTON INDUSTRIES, SAN CARLOS, CALIF.
DESCRIPTORS: (*MICROWAVE AMPLIFIERS, X-BAND, *ELECTRON BEAMS, *ELECTRON TUBES, *ELECTRON GUNS, DESIGN, RADIOFREQUENCY POWER, COMPUTERS, MANUFACTURING METHODS, PRODUCTION.) (WAVEGUIDE COUPLERS, STANDING WAVE RATIOS, IMPEDANCE MATCHING.)

*ELECTRON GUNS

AD-271 399 62-2-2 DIV. 8
LITTON INDUSTRIES, SAN CARLOS, CALIF.
DESCRIPTORS: (*MICROWAVE AMPLIFIERS, X-BAND, *ELECTRON BEAMS, *ELECTRON TUBES, *ELECTRON GUNS, DESIGN, RADIOFREQUENCY POWER, COMPUTERS, MANUFACTURING METHODS, PRODUCTION.) (WAVEGUIDE COUPLERS, STANDING WAVE RATIOS, IMPEDANCE MATCHING.)

*ELECTRON TRANSITIONS

AD-271 370 62-2-2 DIV. 25
UPPSALA U. (SWEDEN).
DESCRIPTORS: (RADIOACTIVE DECAY, *ELECTRON TRANSITIONS, *QUANTUM MECHANICS, *PROGRAMMING, MATHEMATICAL ANALYSIS, LEAST SQUARES METHOD, POLYNOMIALS.)

*ELECTRON TUBES

AD-270 975 62-2-2 DIV. 8
RCA INDUSTRIAL TUBE PRODUCTS, LANCASTER, PA.
DESCRIPTORS: (*ELECTRON TUBES, ELECTRODES, *MANUFACTURING METHODS, PRODUCTION, PROCESSING, DESIGN, TESTS, TEST EQUIPMENT, TEST METHODS.)

AD-271 399 62-2-2 DIV. 8
LITTON INDUSTRIES, SAN CARLOS, CALIF.
DESCRIPTORS: (*MICROWAVE AMPLIFIERS, X-BAND, *ELECTRON BEAMS, *ELECTRON TUBES, *ELECTRON GUNS, DESIGN, RADIOFREQUENCY POWER, COMPUTERS, MANUFACTURING METHODS, PRODUCTION.) (WAVEGUIDE COUPLERS, STANDING WAVE RATIOS, IMPEDANCE MATCHING.)

*ELECTRONIC CIRCUITS

AD-271 046 62-2-2 DIV. 8
LOCKHEED MICROSYSTEMS ELECTRONICS, SUNNYVALE, CALIF.
DESCRIPTORS: (*INTERMEDIATE FREQUENCY AMPLIFIERS, *ELECTRONIC CIRCUITS, *THIN FILMS, ELECTRODES, *ELECTROSTATIC CAPACITANCE, DIELECTRICS.) (THIN FILMS, THICKNESS, RESISTANCE, ELECTROSTATIC CAPACITANCE, TEMPERATURE, DIELECTRIC PROPERTIES.)

*ELECTRONIC EQUIPMENT

AD-271 196 62-2-2 DIV. 9
PHILCO CORP., PHILADELPHIA, PA.
DESCRIPTORS: (*SPEECH, *SPEECH TRANSMISSION, *SPEECH REPRESENTATION, *ELECTRONIC EQUIPMENT, SYNTHESIS, CODING, DESIGN,) (*VOICE COMMUNICATION SYSTEMS, DATA TRANSMISSION SYSTEMS, PRINTED CIRCUITS, ELECTRONIC CIRCUITS, TIMING CIRCUITS, BAND-PASS FILTERS, ANALOG SYSTEMS, DIGITAL SYSTEMS, DESIGN.)

*ELECTRONIC SWITCHES

AD-271 064 62-2-2 DIV. 8
BOMAC LABS., INC., BEVERLY, MASS.
DESCRIPTORS: (*RADAR DUPLEXERS, *SWITCHING CIRCUITS, *TRANSMIT-RECEIVE TUBES, *ELECTRONIC SWITCHES, SINGLE CRYSTALS, BROADBAND, K BAND, DESIGN.)

AD-271 354 62-2-2 DIV. 8
RADIATION, INC., MELBOURNE, FLA.
DESCRIPTORS: (*PANEL BOARD (ELECTRICITY), ELECTRONIC EQUIPMENT, *SWITCHING CIRCUITS, NEGATIVE RESISTANCE CIRCUITS, ELECTRONIC CIRCUITS, IMPEDANCE, AUTOMATIC, DIODES, *ELECTRONIC SWITCHES, SOLID STATE PHYSICS, INTERFERENCE, DESIGN, MULTICHANNEL TELEPHONE SYSTEMS.)

*ELECTRONIC SYSTEMS

AD-271 367 62-2-2 DIV. 8
SYLVANIA ELECTRIC PRODUCTS, INC., WALTHAM, MASS.
DESCRIPTORS: (*RELIABILITY, DETERMINATION, *ELECTRONIC SYSTEMS, ELECTRONIC EQUIPMENT.) (STATISTICAL ANALYSIS, NUMERICAL METHODS AND PROCEDURES, *MATHEMATICAL PREDICTION, FAILUE (MECHANICS), TIME, MEASUREMENT.)

*ELECTRONS

AD-271 359 62-2-2 DIV. 20
SARAH MELLON SCAIFE RADIATION LAB., U. OF PITTSBURGH, PA.
DESCRIPTORS: (*ELECTRONS, NUCLEAR PHYSICS, NUCLEAR ENERGY, GASES, *POSITRONIUM, ELECTRIC FIELDS, PARTICLES, MAGNETIC FIELDS, SCATTERING, POLARIZATION.) (*ATOMIC ORBITALS, MOMENTS, BETA RAY PARTICLES, GAMMA RAYS, ARGON, NITROGEN, OXYGEN.) (GEOMETRY, MATHEMATICAL ANALYSIS.)

AD-271 434 62-2-2 DIV. 25
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.
DESCRIPTORS: (AIR, *ELECTRONS, *IONS, *OXYGEN ATOMS.) (ATMOSPHERE, ELECTRICAL PROPERTIES,) (ELECTRONS, DRIFT, MEASUREMENT.)

AD-271 609 62-2-2 DIV. 2
BOEING SCIENTIFIC RESEARCH LABS., SEATTLE, WASH.
DESCRIPTORS: (*ASTROPHYSICS, ELECTRONS, TEMPERATURE, *EXOSPHERE.) (CYCLOTRONS, RESONANCE, DAMPING, ATTENUATION, ANALYSIS.)

*ELECTROPLATING

AD-271 520 62-2-2 DIV. 26
PHILCO CORP., BLUE BELL, PA.
DESCRIPTORS: (PHOTOELECTRIC MATERIALS, *GOGGLES FOR THEORY, DESIGN.) (*ELECTROPLATINGOF METAL FILMS, SILVER ALLOYS, SODIUM ALLOYS ON GLASS ELECTRODES, CERAMIC COATINGS, TIN COMPOUNDS, OXIDES, ELECTRICAL CONDUCTANCE FOR

CONTROL OF LIGHT TRANSMISSION AND REFLECTION.) (ELECTROLYTES: SOLUTIONS: SILVER COMPOUNDS: SODIUM COMPOUNDS: IODIDES: ELECTRIC CURRENTS: ELECTRIC POTENTIAL.) (LENSES: DISPLAY SYSTEMS: TRANSPARENT PANELS: SPACE ENVIRONMENTAL CONDITIONS.) SAFETY: *PHOTOELECTRIC SHUTTERS.

*ELECTROSTATIC CAPACITANCE

AD-271 044 62-2-2 DIV. 9
LOCKHEED MICROSYSTEMS ELECTRONICS: SUNNYVALE: CALIF.
DESCRIPTORS: (*INTERMEDIATE FREQUENCY AMPLIFIERS: *ELECTRONIC CIRCUITS: *THIN FILMS: ELECTRODES: *ELECTROSTATIC CAPACITANCE: DIELECTRICS.) (THIN FILMS: THICKNESS: RESISTANCE: ELECTROSTATIC CAPACITANCE: TEMPERATURE: DIELECTRIC PROPERTIES.)

*ELECTROSTATIC FIELDS

AD-271 058 62-2-2 DIV. 3
ILLINOIS STATE WATER SURVEY: URBANA.
DESCRIPTORS: (*RAINDROPS: MEASUREMENT: PHOTOGRAPHIC ANALYSIS: INSTRUMENTATION.) (RAINDROPS: *ELECTROSTATIC FIELDS.) (RAINDROPS: STABILITY.) (PRECIPITATION: METEOROLOGICAL RADAR.)

*ELECTROSTATIC PRECIPITATION

AD-271 466 62-2-2 DIV. 10
LITTLE: ARTHUR D.: CAMBRIDGE: MASS.
DESCRIPTORS: (*JET ENGINE FUELS: AVIATION FUELS: ROCKET FUELS: *LIQUID ROCKET PROPELLANTS: CONTAMINATION: IMPURITIES: WATER: SOLIDS: PARTICLES: PURIFICATION: SEPARATION: TESTS.) (FUEL FILTERS: *CENTRIFUGE SEPARATION: *ELECTROSTATIC PRECIPITATION.)

*ERRORS

AD-271 063 62-2-2 DIV. 30
ELECTRONICS RESEARCH LAB.: U. OF CALIF.: BERKELEY.
DESCRIPTORS: (*ERRORS: *DETECTION: *CODING.) (DIGITAL SYSTEMS: DATA TRANSMISSION SYSTEMS: INFORMATION THEORY.)

*ESTERS

AD-271 592 62-2-2 DIV. 6
WYANDOTTE CHEMICALS CORP.: MICH.
DESCRIPTORS: (*ESTERS: *ALKYL RADICALS: *PERCHLORATES: SYNTHESIS: CHEMICAL REACTION: ALKYL RADICALS: IODIDES: SILVER COMPOUNDS: PERCHLORATES: COMPLEX COMPOUNDS: UREA: MOLECULAR STRUCTURE: STABILITY.) (X-RAY DIFFRACTION ANALYSIS: INFRARED SPECTROSCOPY.) EXPLOSIVS.

*ETHYLENES

AD-270 956 62-2-2 DIV. 6
MELLON INST. OF INDUSTRIAL RESEARCH: PITTSBURGH: PA.
DESCRIPTORS: (*POLYMERS: *ETHYLENES: OXIDES: *STYRENES: CRYSTALS: CRYSTAL STRUCTURE: MOLECULAR WEIGHT: PHYSICAL PROPERTIES: VISCOSITY: MECHANICAL PROPERTIES: MOLECULAR STRUCTURE: STABILITY: SYNTHESIS: POLYMERIZATION: FREE RADICALS: IONS.) (TEST METHODS: TEST EQUIPMENT: TORSION METERS: X-RAY DIFFRACTION ANALYSIS.)

*EVAPOTRANSPIRATION

AD-271 139 62-2-2 DIV. 2
AGRICULTURAL RESEARCH SERVICE: RIVERSIDE: CALIF.
DESCRIPTORS: (WATER: EVAPORATION: *EVAPOTRANSPIRATION: *SOILS: MONTMORILLONITE: ATMOSPHERE: *MICROMETEOROLOGY.) (VAPOR PRESSURE: HYGROMETERS: TEMPERATURE: RESISTANCE THERMOMETERS.)

*EXPANDED PLASTICS

AD-271 567 62-2-2 DIV. 8
PLASTICS RESEARCH LAB.: MASS. INST. OF TECH.: CAMBRIDGE.
DESCRIPTORS: (*RADOMES: MATERIALS: BRITTLE MATERIALS: *EXPANDED PLASTICS: POLYMERS: *URETHANES.) (DENSITY: TENSILE PROPERTIES: MECHANICAL PROPERTIES: PRODUCTION: QUALITY CONTROL: FAILURE (MECHANICS): FRACTURE (MECHANICS): WELDED JOINTS: BONDED JOINTS: DESIGN: RELIABILITY.) (TESTS: TEST METHODS.)

*EXPLOSIONS

AD-271 165 62-2-2 DIV. 22
BALLISTIC RESEARCH LABS.: ABERDEEN PROVING GROUND: MD.
DESCRIPTORS: (*BLAST: *SHOCK WAVES: COPPER: *WIRE: *EXPLOSIONS: ARGON: INTERFEROMETERS: PLASMA PHYSICS: ELECTRONS: DENSITY.)

*EXPLOSIVE FORMING

AD-270 900 62-2-2 DIV. 17
ARMED SERVICES TECHNICAL INFORMATION AGENCY: ARLINGTON: VA.
DESCRIPTORS: (ALLOYS: ALUMINUM ALLOYS: HAFNIUM ALLOYS: HEAT RESISTANT ALLOYS: METAL PLATES: METALS: MOLYBDENUM ALLOYS: NIOBIUM ALLOYS: POWDER ALLOYS: REFRACTORY MATERIALS: RHENIUM ALLOYS: SHEETS: STAINLESS STEEL: STEEL: TANTALUM ALLOYS: TITANIUM ALLOYS: TUNGSTEN ALLOYS.) (VANADIUM ALLOYS: ZIRCONIUM ALLOYS.) (MANUFACTURING METHODS: METAL FORMING PRESSES: WELDING: EXTRUSION.) (EXPLOSIVES: SHOCK WAVES: ENERGY: TRANSMISSION WATER: OILS.) (AIRFRAMES: CYLINDRICAL BODIES: SPHERES: STRUCTURAL SHELLS: HEMISPHERICAL SHELLS.) *EXPLOSIVE FORMING: *BIBLIOGRAPHY: *METALLURGY: HARDENING: USSR: GREAT BRITAIN.

AD-271 401 62-2-2 DIV. 17
LITTLE: ARTHUR D.: INC.: CAMBRIDGE: MASS.
DESCRIPTORS: (*ALUMINUM: *EXPLOSIVE FORMING.) (TESTS: ELASTICITY: WAVE TRANSMISSION: PLASTICITY: STRESSES: TENSILE PROPERTIES: *MECHANICAL PROPERTIES.) *METALS: ALLOYS.

*EXPLOSIVES

AD-271 550 62-2-2 DIV. 22
GENERAL TECHNOLOGY CORP.: ELGIN: ILL.
DESCRIPTORS: (*CYLINDRICAL BODIES: *EXPLOSIVES: *PROJECTILES: MECHANICAL PROPERTIES: STRESSES: *HIGH EXPLOSIVE AMMUNITION: DEFORMATION: DESIGN: TEST METHODS: DIGITAL COMPUTERS.) (CYLINDRICAL BODIES: STRESSES: MEASUREMENT: ROTATING BANDS.)

*EXTRATERRESTRIAL BASES

AD-271 062 62-2-2 DIV. 6
ANTENNA LAB.: OHIO STATE U. RESEARCH FUNDATION: COLUMBUS.
DESCRIPTORS: (*AERIAL RECONNAISSANCE: *EXTRA TERRESTRIAL BASES: *RADIOMETERS: THERMAL TAGETS: THERMAL RADIATION: MICROWAVES: TERRAIN: WAVE TRANSMISSION: REFLECTION: DETECTION: SCATTERING: ATTENUATION: MILITARY INTELLIGENCE: FEASIBILITY STUDIES.) (ANTIRADAR COATINGS: RADAR ECHO AREAS: TEMPERATURE: RADAR TARGET: MEASUREMENT.)

*EXTRATERRESTRIAL RADIO WAVES

AD-270 931 62-2-2 DIV. 2
RADIO OBSERVATORY: CALIF. INST. OF TECH.: OWENS VALLEY: CALIF.
DESCRIPTORS: (*JUPITER: *EXTRATERRESTRIAL RADIO WAVES: INTENSITY: POLARIZATION: MEASUREMENT.)

AD-270 932 62-2-2 DIV. 2
RADIO OBSERVATORY: CALIF. INST. OF TECH.: OWENS VALLEY: CALIF.
DESCRIPTORS: (*RADIO WAVES: *EXTRATERRESTRIAL RADIO WAVES: RADIO SIGNALS, SOURCES.) (*STARS: *GALAXIES: BRIGHTNESS: VISIBILITY: FOURIER ANALYSIS: SERIES.) *RADIO ASTRONOMY.

*EXTRUSION

AD-270 976 62-2-2 DIV. 17
REPUBLIC AVIATION CORP.: FARMINGDALE: N. Y.
DESCRIPTORS: (AIRFRAMES: MATERIALS: *TITANIUM ALLOYS: ALUMINUM ALLOYS: MOLYBDENUM ALLOYS: *EXTRUSION: MANUFACTURING METHODS: PROCESSING: DIES: CERAMIC COATINGS: GLASS: LUBRICATION: METAL FORMING PRESSES.) (COATINGS: OXYGEN: CHEMICAL REACTIONS: CONTAMINATION ON HEAT TREATMENT.) (MECHANICAL PROPERTIES: TENSILE PROPERTIES: SURFACE PROPERTIES: HARDNESS: MICROSTRUCTURE.)

*FACTOR ANALYSIS

AD-271 387 62-2-2 DIV. 28
EDUCATIONAL TESTING SERVICE: PRINCETON: N. J.
DESCRIPTORS: (*INDUSTRIAL PSYCHOLOGY: ACHIEVEMENT TESTS: APTITUDE TESTS: *PERSONALITY TESTS: *FACTOR ANALYSIS: JOB ANALYSIS: TEST METHODS.) (BEHAVIOR: ATTITUDES: LEADERSHIP.)

*FATIGUE (MECHANICS)

AD-271 067 62-2-2 DIV. 25
METALS RESEARCH LAB.: BROWN U.: PROVIDENCE: R. I.
DESCRIPTORS: (ALUMINUM ALLOYS: *FATIGUE (MECHANICS): *ULTRASONICS, ULTRASONIC PROPERTIES: ATTENUATION: VELOCITY: MEASUREMENT.) (STRESSES: SURFACES: SIMULATION: MICROSCOPY, ELECTRON MICROSCOPY: TEST METHODS: TEST EQUIPMENT.) LATTICES: DEFORMATION: ALLOYS.

AD-271 151 62-2-2 DIV. 25
MASSACHUSETTS INST. OF TECH.: CAMBRIDGE.
DESCRIPTORS: (*METALS: *CANTILEVER BEAMS: *FATIGUE (MECHANICS): *VIBRATION: *SHEAR STRESSES: LOADING: DEFORMATION: *LOAD DISTRIBUTION.) (TIME: MATERIALS: FREQUENCY: DAMPING: OSCILLATION.) (PROBABILITY: STATISTICAL DISTRIBUTIONS: STATISTICAL FUNCTIONS: HARMONIC ANALYSIS: STATISTICAL PROCESSES: GEOMETRY: INTEGRATION: DIFFERENTIAL EQUATIONS: INTEGRAL EQUATIONS: NUMERICAL ANALYSIS: SEQUENCES.)

*FATTY ACIDS

AD-271 594 62-2-2 DIV. 4
DIRECTORATE OF MATERIALS AND PROCESSES: AERONAUTICAL SYSTEMS DIV.: WRIGHT-PATTERSON AIR FORCE BASE: OHIO.
DESCRIPTORS: (*FATTY ACIDS: ORGANIC ACIDS: *CARBOXYLIC ACIDS: FORMIC ACIDS: PROPIONIC ACIDS: OCTANOIC ACIDS: CAPRIC ACIDS: ACETIC ACIDS: VALERIC ACIDS: X-RAY DIFFRACTION ANALYSIS: CRYSTAL STRUCTURE: CRYSTALS: MOLECULES: THERMAL EXPANSION.) (ORGANIC ACIDS: BUTANES: HEPTANES: HEXANES: OCTANES.) (SOLIDS: LIQUIDS: MIXTURES.)

*FEEDING

AD-271 475 62-2-2 DIV. 29
WHIRLPOOL CORP.: ST. JOSEPH: MICH.
DESCRIPTORS: (*CONTAINERS: FOOD: STORAGE: PREPARATION: SPACE FLIGHT: *FEEDING.) DESIGN: PRODUCTION: TESTS.

*FERROCENES

AD-270 961 62-2-2 DIV. 16
PLASTICS LAB.: PRINCETON U.: N. J.
DESCRIPTORS: (*POLYMERS: *PLASTICS: *FERROCENES: *DIELECTRICS: *SEMICONDUCTORS: ORGANIC MATERIALS: DIELECTRIC PROPERTIES: ELECTRICAL PROPERTIES: CONDUCTIVITY: SYNTHESIS: MECHANICAL PROPERTIES: PHASE STUDIES: VISCOSITY: TEST METHODS: PRESSURE.) (POLYMERIZATION: ETHYLENES: ORGANIC COMPOUNDS: VINYL RADICALS: ALLYL RADICALS.) (BUTADIENES: BUTENES: PROPENES.) METHODS: PRESSURE.) (POLYMERIZATION: ETHYLENES: ORGANIC COMPOUNDS: VINYL RADICALS: ALLYL RADICALS.) (BUTADIENES: BUTENES: PROPENES.)

*FERROELECTRIC MATERIALS

AD-270 999 62-2-2 DIV. 25
RAYTHEON CO.: WALTHAM: MASS.
DESCRIPTORS: (*STRONTIUM COMPOUNDS: TITANATES: TEMPERATURE: *MICROWAVES: ABSORPTION: ATTENUATION.) *FERROELECTRIC MATERIALS.

*FERROMAGNETISM

AD-271 587 62-2-2 DIV. 25
NAVAL ORDNANCE LAB.: CORONA: CALIF.
DESCRIPTORS: (*TELEPHONE COMMUNICATION SYSTEMS: PANEL BOARDS (ELECTRICITY): NOISE GENERATORS: THEORY: DESIGN.) (*FERROMAGNETSM: *IRON ALLOYS: *NICKEL ALLOYS: FILMS.) (*RARE GASES: INFRARED SPECTROSCOPY: INTERFEROMETERS: ELECTROMAGNETIC WAVES: WAVE TRANSMISSION.) (*SEMICONDUCTORS: *SILICON: MAGNETO-OPTIC ROTATION.) (*HEAT RESISTANT POLYMERS: *POLYMERS: *PHOSPHINES: PHENYL RADICALS: CHLORIDES: SYNTHESIS: CHEMICAL REACTIONS.) (SOLID STATE PHYSICS: *MICROWAVE OSCILLATORS: *DIODES: *RARE EARTH COMPOUNDS: CALCIUM COMPOUNDS, FLUORIDES: *THULIUM COMPOUNDS: SPECTROPHOTOMETERS: ABSORPTION: FLUORESCENCE: CRYSTALS.) (*GUIDED MISSILE ANTENNAS: *SLOT ANTENNAS: *WAVEGUIDE SLOTS: DIELECTRICS: ANTENNA RADIATION PATTERNS: MEASUREMENT.)

*FIRE BOMBS

AD-271 598 62-2-2 DIV. 3
AIR FORCE PROVING GROUND COMMAND: EGLIN AIR FORCE BASE: FLA.
DESCRIPTORS: (*FIRE BOMBS: *INCENDIARY BOMBS: *BOMB FUZES: *ELECTRIC FUZES: PROCESSING: LOADING: RELIABILITY: FLIGHT TESTING: SAFETY: TEMPERATURE: PRESSURE: TESTS.)

*FLAMES

AD-271 055 62-2-2 DIV. 10
MIDWEST RESEARCH INST.: KANSAS CITY: MO.
DESCRIPTORS: (THERMODYNAMICS: *FLAMES WITH GASES: METALS: *MASS SPECTROSCOPY: MASS SPECTOMETERS: SAMPLING.)

AD-271 171 62-2-2 DIV. 25
AERONUTRONIC: NEWPORT BEACH: CALIF.
DESCRIPTORS: (*CARBON DIOXIDE: *RADIATION TOLERANCE: TRANSMISSION: BEHAVIOR.) (*FLAMES: INTENSITY: ABSORPTION.) (STATISTICAL ANALYSIS: TABLES.)

AD-271 360 62-2-2 DIV. 10
TEXACO EXPERIMENT, INC.: RICHMOND: VA.
DESCRIPTORS: (*RECOMBINATION REACTIONS: *REACTION KINETICS: *IONS: *FLAMES: COMBUSTION.) (CHEMICAL REACTIONS: TEMPERATURE: PRESSURE: GASES: TESTS: THEORY.) (HYDROXIDES: TRITIUM OXIDE: IONS.) (METHANES: PROPANES: ACETYLENES: CHLORINE.)

*FLUID FLOW

AD-271 083 62-2-2 DIV. 9
RCA DEFENSE ELECTRONIC PRODUCTS: MOORESTOWN: N. J.
DESCRIPTORS: (*FLUID FLOW: BOUNDARY LAYER: ENERGY: *VISCOSITY: *WAKE: VELOCITY.) (TRASFORMATIONS (MATHEMATICS): MATHEMATICAL ANALYSIS.)

AD-271 376 62-2-2 DIV. 25
APPLIED PHYSICS LAB.: JOHNS HOPKINS U.: SILVER SPRING: MD.
DESCRIPTORS: (BOUNDARY LAYER: *FLUID FLOW: DRAG: SURFACE PROPERTIES.) (*WAVE CHARACTERISTICS: SUBSONIC FLOW: COMPRESSIBLE FLOW: *MACH NUMBER: SUPERSONIC FLOW.)

AD-271 471 62-2-2 DIV. 25
BROWN U. DIV. OF APPLIED MATHEMATICS: PROVIDENCE: R. I.

DESCRIPTORS: (*CYLINDRICAL BODIES, ROTATION, ELASTICITY, *STRESSES, VISCOSITY.) (BOUNDARY LAYER, *FLUID FLOW, SURFACES.)

AD-271 607 62-2-2 DIV. 9
BOEING SCIENTIFIC RESEARCH LABS., SEATTLE, WASH.
DESCRIPTORS: (*FLUID FLOW, ELASTICITY, STABILITY, TENSILE PROPERTIES, DAMPING.) (*INTEGRAL EQUATIONS, *REYNOLDS NUMBER.)

AD-271 614 62-2-2 DIV. 9
HUDSON LAB., COLUMBIA U., DOBBS FERRY, N. Y.
DESCRIPTORS: (*STABILITY OF *FLUID FLOW, VISCOSITY, THERMAL CONDUCTIVITY, HEAT, TEMPERATURE.) (PARTIAL DIFFERENTIAL EQUATIONS, SERIES, INTEGRATION, COMPLEX VARIABLES.)

*FLUID MECHANICS

AD-271 646 62-2-2 DIV. 9
INSTITUTE OF ENGINEERING RESEARCH, U. OF CALIF., BERKELEY.
DESCRIPTORS: (*SUPERSONIC FLOW, *GAS IONIZATION, *FLUID MECHANICS, *PLASMA PHYSICS.) (DIFFUSION, PRESSURE, *BOUNDARY LAYER.) (SHOCK WAVES, IONS, DENSITY, TEMPERATURE, COOLING.) (WIND TUNNELS, ELECTRIC ARCS, HEATING.) DIFFERENTIAL EQUATIONS.

*FLUORESCENCE

AD-270 919 62-2-2 DIV. 25
CORNELL U., ITHACA, N. Y.
DESCRIPTORS: (*ARGON, *X-RAY SPECTRUM, *FLUORESCENCE, MEASUREMENT, PULSE HEIGHT ANALYZERS, ATOMIC STRUCTURE.) (RADIOACTIVE ISOTOPES, IRON.)

*FLUORIDES

AD-271 173 62-2-2 DIV. 4
FLORIDA U. ENGINEERING AND INDUSTRIAL EXPERIMENT STATION, GAINSVILLE.
DESCRIPTORS: (*FLUOROCARBONS, *NITROGEN COMPOUNDS, *FLUORIDES, CHEMICAL REACTIONS.) (FREE RADICALS, FLUORIDES, AZIDES, DISSOCIATION, HYDRAZINES, PYROLYSIS, ULTRAVIOLET RADIATION, DECOMPOSITION, CHEMICAL BONDS, STABILITY, CARBONYL RADICALS, IMIDES, FLUORINATION.) (INFRARED SPECTROSCOPY, CHROMATOGRAPHIC ANALYSIS.)

*FLUOROCARBONS

AD-271 173 62-2-2 DIV. 4
FLORIDA U. ENGINEERING AND INDUSTRIAL EXPERIMENT STATION, GAINSVILLE.
DESCRIPTORS: (*FLUOROCARBONS, *NITROGEN COMPOUNDS, *FLUORIDES, CHEMICAL REACTIONS.) (FREE RADICALS, FLUORIDES, AZIDES, DISSOCIATION, HYDRAZINES, PYROLYSIS, ULTRAVIOLET RADIATION, DECOMPOSITION, CHEMICAL BONDS, STABILITY, CARBONYL RADICALS, IMIDES, FLUORINATION.) (INFRARED SPECTROSCOPY, CHROMATOGRAPHIC ANALYSIS.)

AD-271 176 62-2-2 DIV. 14
GENERAL DYNAMICS/ASTRONAUTICS, SAN DIEGO, CALIF.
DESCRIPTORS: (*HIGH TEMPERATURE RESEARCH, NIOBIUM ALLOYS, *ALLOYS, *REFRACTORY MATERIALS, REFRACTORY COATINGS.) (*LOW TEMPERATURE RESEARCH, *ADHESIVES, METALS, THERMAL INSULATION, ALLOYS, STAINLESS STEEL, AUSTENITE.) (MECHANICAL PROPERTIES, DEFORMATION, PLASTICITY, NUCLEAR REACTIONS, RADIATION EFFECTS.) (*PLASTICS, *FLUOROCARBONS, CERAMIC MATERIALS.)

*FLYING PLATFORMS 3599132-)

AD-271 500 62-2-2 DIV. 1
AVRO AIRCRAFT, LTD. (CANADA).
DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, *FLYING PLATFORMS, AERODYNAMICS, PRESSURE, JETS, FLAPS, CONTROL SYSTEMS, FLIGHT TESTING.)

AD-271 502 62-2-2 DIV. 1
AVRO AIRCRAFT, LTD. (CANADA).
DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, *FLYING PLATFORMS, WIND TUNNEL MODELS, MODEL TESTS, DESIGN, AERODYNAMICS, AERODYNAMIC CONFIGURATIONS, AERODYNAMIC DATA, TABLES.)

*FORGING

AD-271 030 62-2-2 DIV. 17
DEFENSE METALS INFORMATION CENTER, COLUMBUS, OHIO.
DESCRIPTORS: (*REFRACTORY MATERIALS, *FORGING, MOLYBDENUM, MOLYBDENUM ALLOYS, TUNGSTEN, TUNGSTEN ALLOYS, TANTALUM, TANTALUM ALLOYS, NIOBIUM, NIOBIUM ALLOYS.) PREPARATION, POWDER METALLURGY, METAL FORMING PRESSES, FORGE PRESSES, HEATING, DIES, LUBRICANTS, DESIGN, MECHANICAL PROPERTIES.

AD-271 526 62-2-2 DIV. 17
METALS AND CERAMICS LAB., AERONAUTICAL SYSTEMS DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: (*TITANIUM ALLOYS FOR *FORGING.) (TESTS, MECHANICAL PROPERTIES, TENSILE PROPERTIES, ELASTICITY, SHEAR STRESSES, THERMAL STRESSES, STABILITY, IMPACT SHOCK, FRACTURE MECHANICS), TORSION METERS, HIGH TEMPERATURE RESEARCH, LOW TEMPERATURE RESEARCH.) (MECHANICAL PROPERTIES, TABLES.) ALLOYS.

*FRACTURE (MECHANICS)

AD-271 009 62-2-2 DIV. 25
SYRACUSE U., N. Y.
DESCRIPTORS: (*FRACTURE (MECHANICS), *METALS, *ALLOYS, *TITANIUM ALLOYS, ALUMINUM ALLOYS, VANADIUM ALLOYS, STRESSES, DEFORMATION, PROPAGATION, GRAINS (METALLURGY), METALLURGICAL ANALYSIS, THEORY.)

*FREE RADICALS

AD-271 563 62-2-2 DIV. 30
LUND U. (SWEDEN).
DESCRIPTORS: (*PHOTOLYSIS, ORGANIC SOLVENTS, METHYL RADICALS, PENTANES, CARBON COMPOUNDS, SULFIDES, ETHYL RADICALS, IODIDES.) (*SPECTROPHOTOMETERS, DESIGN, LOW TEMPERATURE RESEARCH, *THERMOCHEMISTRY, *CHEMICAL BONDS, *RECOMBINATION REACTIONS, *FREE RADICALS.) SWEDEN.

*FREQUENCY STABILIZERS

AD-271 100 62-2-2 DIV. 25
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: *MASERS, *BIBLIOGRAPHY, *MICROWAVE AMPLIFIERS, *FREQUENCY STABILIZERS, USSR, ELECTRONICS, SCIENTIFIC RESEARCH, *RUBY, *PARAMAGNETIC RESONANCE, CRYOGENICS, PARAMETRIC AMPLIFIERS.

*FUEL ADDITIVES

AD-271 508 62-2-2 DIV. 10
AEROCNUTRONIC, NEWPORT BEACH, CALIF.
DESCRIPTORS: (SOLID ROCKET PROPELLANTS, LIQUID ROCKET PROPELLANTS, *FUEL ADDITIVES, *BERYLLIUM, BERYLLIUM COMPOUNDS, OXIDES, COMBUSTION, CHEMICAL REACTIONS, THERMODYNAMICS, TESTS.) (COMBUSTION CHAMBER GASES EXHAUST GASES, HYDROGEN, BERYLLIUM COMPOUND, HYDROXIDES, VAPORS, HEAT OF FORMATION, MASS SPECTROSCOPY, SPECTROGRAPHIC ANALYSIS.)

*FUEL CELLS

AD-271 005 62-2-2 DIV. 7
PENNSYLVANIA STATE U. MINERAL INDUSTRIES EXPERIMENT STATION, UNIVERSITY PARK.
DESCRIPTORS: (*FUEL CELLS, OXIDATION-REDUCTION REACTIONS, *TIN COMPOUNDS, CHLORIDES, HYDROCHLORIC ACID, FORMALDEHYDE, HEATING.) (PASS SPECTROSCOPY, QUANTITATIVE ANALYSIS, GASES, CARBON DIOXIDE, METHANES, CARBON COMPOUNDS, OXIDES.) *POWER SUPPLIES, ELECTROCHEMISTRY.

*FUEL FILTERS

AD-271 373 62-2-2 DIV. 10
AIR PRODUCTS AND CHEMICALS, INC., ALLENTOWN, PA.
DESCRIPTORS: (*OXYGEN, *LIQUEFIED GASES, *LIQUID ROCKET PROPELLANTS, ROCKET OXIDIZERS, CONTAMINATION, PURIFICATION, CHEMICAL IMPURITIES, HYDROCARBONS, SOLIDIFIED GASES, CARBON DIOXIDE, HANDLING, SAFETY, *FUEL FILTERS, DESIGN.)

*FUEL STORAGE TANKS

AD-271 001 62-2-2 DIV. 10
NAVAL RESEARCH LAB., WASHINGTON, D. C.
DESCRIPTORS: (*FUEL STORAGE TANKS AND *PROPELLANT TANKS FOR LIQUID ROCKET PROPELLNTS AND ROCKET OXIDIZERS, STORAGE, HAZARDS, RELIABILITY.) (*PAINTS, COATINGS, *CHEMICAL INDICATORS.) NAVAL VESSELS.

*FUNCTIONS

AD-271 038 62-2-2 DIV. 15
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*FUNCTIONS, *MATHEMATICAL LOGIC, LATTICES, *LINEAR SYSTEMS, NUMBER THEORY, INEQUALITIES, REAL VARIABLES, COMPLEX VARIABLES, ALGEBRA.)

*FUNGUS INFECTIONS

AD-270 920 62-2-2 DIV. 16
BIOLOGICAL LABS., FREDERICK, MD.
DESCRIPTORS: (*BIBLIOGRAPHY, *FUNGUS INFECTIONS.) (DIAGNOSIS, CULTURE MEDIA, IMMUNIZATION, CHEMOTHERAPEUTIC AGENTS, DISEASE CARRIERS, EXPERIMENTAL DATA.)

*GALAXIES

AD-270 932 62-2-2 DIV. 2
RADIO OBSERVATORY, CALIF. INST. OF TECH., ORENS VALLEY, CALIF.
DESCRIPTORS: (*RADIO WAVES, *EXTRATERRESTRIAL RADIO WAVES, RADIO SIGNALS, SOURCES.) (*STARS, *GALAXIES, BRIGHTNESS, VISIBILITY, FOURIER ANALYSIS, SERIES.) *RADIO ASTRONOMY.

*GAMMA RAYS

AD-271 479 62-2-2 DIV. 16
*ESTERN BIOLOGICAL LABS., CULVER CITY, CALIF.
DESCRIPTORS: (*RADIATION EFFECTS, *GAMMA RAYS, NUTRITION, *VITAMIN B.) (LABORATORY ANIMALS, GROWTH, LEARNING, SURVIVAL.)

*GAS DISCHARGES

AD-270 989 62-2-2 DIV. 9
GIANNINI SCIENTIFIC CORP., SANTA ANA, CALIF.
DESCRIPTORS: (*GAS DISCHARGES, IONIZATION, *DISCHARGE TUBES, *CYLINDRICAL BODIES, COILS.) (INSTRUMENTATION, CAPACITORS, SWITCHES, TRIGGER CIRCUITS, TRANSMISSION LINES.) (PHOTOGRAPHIC ANALYSIS, SCHLIEREN PHOTOGRAPHY, OSCILLOGRAMS, ARGON, AIR.)

*GAS IONIZATION

AD-271 423 62-2-2 DIV. 8
GIANNINI SCIENTIFIC CORP., SANTA ANA, CALIF.
DESCRIPTORS: (*GASES, *ELECTRIC DISCHARGES, GAS DISCHARGES, *GAS IONIZATION, THERMONUCLAR REACTIONS, MAGNETIC FIELDS, *PLASMA PHYSICS, HYDROGEN, ARGON.) (DISCHARGE TUBES, INSTRUMENTATION.) (ELECTRONS, DIFFUSION.)

AD-271 424 62-2-2 DIV. 8
GIANNINI SCIENTIFIC CORP., SANTA ANA, CALIF.
DESCRIPTORS: (*GASES, *ELECTRIC DISCHARGES, GAS DISCHARGES, *GAS IONIZATION, THERMONUCLEAR REACTIONS, MAGNETIC FIELDS, *PLASMA PHYSICS, HYDROGEN, ARGON.) (INSTRUMENTATION, OSCILLOSCOPES, PHOTOMULTIPLIERS, PHOTOGRAPHY.)

AD-271 646 62-2-2 DIV. 9
INSTITUTE OF ENGINEERING RESEARCH, U. OF CALIF., BERKELEY.
DESCRIPTORS: (*SUPERSONIC FLOW, *GAS IONIZATION, *FLUID MECHANICS, *PLASMA PHYSICS.) (DIFFUSION, PRESSURE, *BOUNDARY LAYER.) (SHOCK WAVES, IONS, DENSITY, TEMPERATURE, COOLING.) (WIND TUNNELS, ELECTRIC ARCS, HEATING.) DIFFERENTIAL EQUATIONS.

*GAS TURBINES

AD-271 174 62-2-2 DIV. 27
DEFENSE METALS INFORMATION CENTER, COLUMBUS, OHIO.
DESCRIPTORS: (*HEAT RESISTANT ALLOYS, *NICKEL ALLOYS FOR PRODUCTION OF *GAS TURBINES, ROTATING STRUCTURES, TURBINE BLADES, TURBINE WHEELS, GAS TURBINE ROTORS IN AUXILIARY POWER PLANTS, CENTRIFUGAL PUMPS, FUEL PUMPS OF ROCKET MOTORS, GROUND SUPPORT EQUIPMENT, GAS GENERATING SYSTEMS, RELIABILITY, EFFECTIVENESS.) BOOSTER ROCKETS.

*GASES

AD-271 423 62-2-2 DIV. 8
GIANNINI SCIENTIFIC CORP., SANTA ANA, CALIF.
DESCRIPTORS: (*GASES, *ELECTRIC DISCHARGES, GAS DISCHARGES, *GAS IONIZATION, THERMONUCLAR REACTIONS, MAGNETIC FIELDS, *PLASMA PHYSICS, HYDROGEN, ARGON.) (DISCHARGE TUBES, INSTRUMENTATION.) (ELECTRONS, DIFFUSION.)

AD-271 424 62-2-2 DIV. 8
GIANNINI SCIENTIFIC CORP., SANTA ANA, CALIF.
DESCRIPTORS: (*GASES, *ELECTRIC DISCHARGES, GAS DISCHARGES, *GAS IONIZATION, THERMONUCLEAR REACTIONS, MAGNETIC FIELDS, *PLASMA PHYSICS, HYDROGEN, ARGON.) (INSTRUMENTATION, OSCILLOSCOPES, PHOTOMULTIPLIERS, PHOTOGRAPHY.)

*GEODESICS

AD-271 438 62-2-2 DIV. 2
GEONAUTICS, INC., WASHINGTON, D. C.
DESCRIPTORS: (*GEODESICS, *AERIAL PHOTOGRAPHY, *MAPPING, ROCKETS, PHOTOFLASH PROJECTILES.) (PHOTOGRAPHIC EQUIPMENT, GEODESICS, PHOTOFLSH BULBS.) (TRIGONOMETRY, GEODESICS.)

*GEODETIC ASTRONOMY

AD-271 439 62-2-2 DIV. 2
GEONAUTICS, INC., WASHINGTON, D. C.
DESCRIPTORS: (GEODESICS, *GEODETIC ASTRONOMY, HIGH ALTITUDE, *PHOTOFLASH BOMBS IN SOUNDING ROCKETS FOR POSITION FINDING, *BRIDGES, RANGE CONTROL SYSTEMS FOR *MAPPING,) (TRIGNOMETRY, *PATRIX ALGEBRA, ERRORS, MATHEMATICAL ANALYSIS.) (GEODETIC DATA, DATA PROCESSING SYSTEMS.)

*GEOGRAPHY

AD-271 006 62-2-2 DIV. 2
INDIANA U., BLOOMINGTON.
DESCRIPTORS: (AGRICULTURE, *GEOGRAPHY, LEEWARD ISLANDS, ECONOMICS.)

*GEORGIA

AD-271 014 62-2-2 DIV. 2
AIR WEATHER SERVICE, SCOTT AIR FORCE BASE, IL.
DESCRIPTORS: (*GEORGIA, AIRPORTS, AIR FORCE OPERATIONS, *CLIMATE, WEATHER FORCASTING, HANDBOOKS.)

*GLASS

AD-270 949 62-2-2 DIV. 14
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
DESCRIPTORS: (*THERMAL RADIATION, RADIATION EFFECTS, ATOMIC BOMB EXPLOSIONS, NUCLEAR EXPLOSIONS, HEAT, TRANSMISSION, *GLASS, COATINGS, PROTECTIVE COVERINGS, *ALUMINUM, SHEETS, *WIRE SCREENS.) (TEST METHODS, TEST EQUIPMENT, SPECTROPHOTOMETERS, INDICATOR PAPERS.)

AD-271 462 62-2-2 DIV. 14
FOREST PRODUCTS LAB., MADISON, WIS.
DESCRIPTORS: (*THERMAL RADIATION, NUCLEAR EXPLOSIONS, ATOMIC BOMB EXPLOSIONS, *THERMAL INSULATION, *GLASS, COMBUSTION, INHIBITION, TEXTILES, PAPER, MATERIALS, TEST METHODS.)

*GLUCOSE

AD-271 463 62-2-2 DIV. 16
NAVAL MEDICAL RESEARCH LAB., NEW LONDON, CONN.
DESCRIPTORS: (*GLUCOSE, *ANTHRONES, REAGENTS, *COLORIMETRY, PHOTOELECTRIC CELLS, MEASUREMENT.) *BODY FLUIDS.

*GLYCOLIC ACIDS

AD-271 578 62-2-2 DIV. 16
QUEEN MARY COLL., U. OF LONDON (ST. BRIT.).
DESCRIPTORS: (*ALGAE, *GLYCOLIC ACIDS, PHOTOSYNTHESIS, PRODUCTION.) (CARBON DIOXIDE, LIGHT, INTENSITY, ISONIAZID.) COLORIMETRIC ANALYSIS.

*GOGGLES

AD-271 520 62-2-2 DIV. 26
PHILCO CORP., BLUE BELL, PA.
DESCRIPTORS: (PHOTOELECTRIC MATERIALS, *GOGGLES FOR THEORY, DESIGN.) (*ELECTROPLATINGOF METAL FILMS, SILVER ALLOYS, SODIUM ALLOYS ON GLASS ELECTRODES, CERAMIC COATINGS, TIN COMPOUNDS, OXIDES, ELECTRICAL CONDUCTANCE FOR CONTROL OF LIGHT TRANSMISSION AND REFLECTION.) (ELECTROLYTES, SOLUTIONS, SILVER COMPOUNDS, SODIUM COMPOUNDS, IODIDES, ELECTRIC CURRENTS, ELECTRIC POTENTIAL.) (LENSES, DISPLAY SYSTEMS, TRANSPARENT PANELS, SPACE ENVIRONMENTAL CONDITIONS.) SAFETY, *PHOTOELECTRIC SHUTTERS.

*GRAPHITE

AD-271 589 62-2-2 DIV. 14
NATIONAL CARBON CO., INC., CLEVELAND, OHIO.
DESCRIPTORS: (*GRAPHITE, *X RAYS, *RADIOGRAPHY, SENSITIVITY, CHEMICAL IMPURITIES, DISTRIBUTION.) (X RAYS, DETECTORS, FLUORESCENT SCREENS, PHOTOGRAPHIC FILM, IONIZATION CHAMBERS, SHEETS, ALUMINUM, SELENIUM, COATINGS.)

*GROUPS (MATHEMATICS)

AD-271 433 62-2-2 DIV. 15
INSTITUTE OF FIELD PHYSICS, U. OF NORTH CAROLINA, CHAPEL HILL.
DESCRIPTORS: (GREEN'S FUNCTION, *ALGEBRAIC TOPOLOGY, QUANTUM MECHANICS, *GROUPS (MATHEMATICS), DIFFERENTIAL EQUATIONS.) (NUMERICAL ANALYSIS, TRANSFORMATIONS (MATHEMATICS), MATRI) ALGEBRA, VECTOR ANALYSIS, INTEGRAL EQUATIONS, COMMUTATORS.)

*GUIDANCE

AD-270 925 62-2-2 DIV. 12
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*SPACE FLIGHT, MARS, *SPACE NAVIGATION, *GUIDANCE, SENSITIVITY, PERTURBATION THEORY, MATHEMATICAL LOGIC, VECTOR ANALYSIS, SPECIFIC IMPULSE, ORBITAL FLIGHT PATHS.)

AD-271 582 62-2-2 DIV. 12
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: SUBSTITUTES FOR GYROSCOPES IN *INERTIAL GUIDANCE, *INERTIAL NAVIGATION, *GUIDANCE, *CONTROL SYSTEMS, USSR.

*GUIDED MISSILE TRAJECTORIES

AD-271 082 62-2-2 DIV. 12
ARMY SIGNAL MISSILE SUPPORT AGENCY, WHITE SANS MISSILE RANGE, N. MEX.
DESCRIPTORS: (*GUIDED MISSILES, SURFACE TO SURFACE, LAUNCHING, LAUNCHING SITES, METEOROLOGICAL DATA, *WIND, *TURBULENCE, *GUIDED MISSILE TRAJECTORIES, DRIFT, MATHEMATICAL PREDICTION, MEASUREMENT, TAYLOR'S SERIES, STATISTICAL FUNCTIONS.)

*GUIDED MISSILES

AD-270 936 62-2-2 DIV. 12
GENERAL DYNAMICS/CONVAIR, SAN DIEGO, CALIF.
DESCRIPTORS: (*GUIDED BOMBS, GUIDED MISSILES, AIR-TO-SURFACE, *TELEVISION GUIDANCE, VELOCITY, MANEUVERABILITY, TARGET RECOGNITIONS, SURFACE TARGETS, INTERCEPTION PROBABILITY, TERMINAL BALLISTICS, SIMULATION, MATHEMATICAL PREDICTION.)

AD-271 082 62-2-2 DIV. 12
ARMY SIGNAL MISSILE SUPPORT AGENCY, WHITE SANS MISSILE RANGE, N. MEX.
DESCRIPTORS: (*GUIDED MISSILES, SURFACE TO SURFACE, LAUNCHING, LAUNCHING SITES, METEOROLOGICAL DATA, *WIND, *TURBULENCE, *GUIDED MISSILE TRAJECTORIES, DRIFT, MATHEMATICAL PREDICTION, MEASUREMENT, TAYLOR'S SERIES, STATISTICAL FUNCTIONS.)

AD-271 099 62-2-2 DIV. 12
DIAMOND ORDNANCE FUZE LABS., WASHINGTON, D. C.
DESCRIPTORS: (*GUIDED MISSILES, *VELOCITY, MEASUREMENT WITH RADAR EQUIPMENT AND ACCELEROMETERS, MATHEMATICAL ANALYSIS.) (GUIDED MISSILES, SURFACE TO SURFACE, CONTROL SYSTEMS, RANGE, VELOCITY, DETERMINATION.) (CONTROL OF COMBUSTION OF ROCKET MOTORS BY DETERMINATION OF SURFACE TO SURFACE, GUIDED MISSILES, VELOCITY.) GUIDED MISSILE TRAJECTORIES, ACCELERATION, DIGITAL SYSTEMS, ERRORS, VIBRATION.

AD-271 112 62-2-2 DIV. 12
NAVAL ORDNANCE LAB., WHITE OAK, MD.
DESCRIPTORS: (HIGH TEMPERATURE RESEARCH, TEST EQUIPMENT, TEST METHODS, *THERMAL INSULATION, HEAT, *INSULATING MATERIALS, HEAT RESISTANT POLYMERS, REFRACTORY MATERIALS, *ABLATION, *GUIDED MISSILES, *RE-ENTRY VEHICLES, *ROCKET CASES, *ROCKET MOTOR NOZZLES,) (MEASUREMENT, TEMPERATURE, THERMAL DIFFUSION, MATHEMATICAL ANALYSIS.) (OXYGEN, ACETYLENES, WELDING, FLAMES.)

AD-271 152 62-2-2 DIV. 12
RIDER, ALTER, AND CO., INC., BELLEVUE, N. J.
DESCRIPTORS: (*GUIDED MISSILES, UNDERWATER TO SURFACE, ROCKET MOTORS, *ROCKET CASES, GLASS TEXTILES, FILAMENT-WOUND CONSTRUCTION, HYDROSTATIC PRESSURE, STRESSES, TESTS, MODE TESTS.)

AD-271 193 62-2-2 DIV. 12
OGDEN AIR MATERIAL AREA, HILL AIR FORCE BASE, UTAH.
DESCRIPTORS: (*GUIDED MISSILES, AIR TO AIR, *ROCKET MOTORS, SHIPPING, *CONTAINERS, IMPACT SHOCK, TESTS, HANDLING, PRESSURE.)

*GUNS

AD-271 383 62-2-2 DIV. 22
ROCK ISLAND ARSENAL LAB., ILL.
DESCRIPTORS: (*GUNS, *ARTILLERY, *SPOTTING RIFLES, *RECOIL MECHANISMS, FEASIBILITY STUDIES, MATHEMATICAL ANALYSIS, DESIGN, TESTS.)

*HALIDES

AD-271 392 62-2-2 DIV. 25
ILLINOIS U., URBANA.
DESCRIPTORS: (*ALKALI METAL COMPOUNDS, *HALIDES, *CRYSTALS, *CRYSTAL STRUCTURE, EXCITATION, PHOTOCONDUCTIVITY, MEASUREMENT.) (FLUORESCENCE, LUMINESCENCE, LIFE EXPECTANCY, PULSE HEIGHT ANALYZERS, L BAND, RELAXATION TIME.) (POTASSIUM COMPOUNDS, CHLORIDES, BROMIDES, IODIDES.)

AD-271 393 62-2-2 DIV. 25
ILLINOIS U., URBANA.
DESCRIPTORS: (*SILVER COMPOUNDS, *BROMIDES, *CHLORIDES, CRYSTALS, ELECTRONS, MAGNETIC FIELDS, *MAGNETIC EFFECTS, *CONDUCTIVITY, PHOTOELECTRONS, RESISTANCE.) (THEORY, SEMICONDUCTORS, METALS, PHOTOCONDUCTIVITY, HALL EFFECT.) TEST METHODS, TEST EQUIPMENT, *HALIDES.

*HANDBOOKS

AD-271 124 62-2-2 DIV. 6
RADIATION, INC., MELBOURNE, FLA.
DESCRIPTORS: (*HANDBOOKS, *TELEMETER SYSTEMS, *TRANSDUCERS, PARTS CATALOGS,) BIBLIOGRAPHY, INDEXES.

*HANDLING

AD-271 385 62-2-2 DIV. 33
CALIFORNIA U., LOS ANGELES.
DESCRIPTORS: (*CARGO, *HANDLING, *RECORDS, STATISTICAL ANALYSIS.) (DATA PROCESSING SYSTEM, DIGITAL COMPUTERS.)

*HARMONIC OSCILLATORS

AD-271 630 62-2-2 DIV. 25
SPERRY MICROWAVE ELECTRONICS CO., CLEARWATER, FLA.
DESCRIPTORS: (FERROMAGNETISM, FERROMAGNETIC MATERIALS, NONLINEAR SYSTEMS, *HARMONIC OSCILLATORS, *RADIOFREQUENCY FILTERS,) (FERRITES, GARNET, BAND-PASS FILTERS, ELECTRONICS, *SOLID STATE PHYSICS.)

*HEAT RESISTANT ALLOYS

AD-270 955 62-2-2 DIV. 17
WAH CHANG CORP., ALBANY, OREG.
DESCRIPTORS: (*HEAT RESISTANT ALLOYS, *TANTALUM ALLOYS, NIOBIUM ALLOYS, VANADIUM ALLOYS, TUNGSTEN ALLOYS, *SHEETS, ROLLING MILLS, RELIABILITY, PRODUCTION, MANUFACTURING METHODS, POWDER METALLURGY, MELTING, PROCESSING, EXTRUSION, FORGING,) (PHYSICAL PROPERTIES, PHASE TRANSITIONS, TRANSITION TEMPERATURE, STRESSES, RUPTURE, HEAT TREATMENT, DEFORMATION, TENSILE PROPERTIES, WELDING, OXIDATION, MACHINING,) AIRFRAMES, GUIDED MISSILES, SPACESHIPS.

AD-271 081 62-2-2 DIV. 17
AEROJET-GENERAL CORP., AZUSA, CALIF.
DESCRIPTORS: (*HEAT RESISTANT ALLOYS, STEEL, STAINLESS STEEL, TITANIUM ALLOYS, VANADIUM ALLOYS, CHROMIUM ALLOYS, *CORROSION, *STRESSES, FRACTURE (MECHANICS), FAILURE (MECHANICS),) (ROCKET CASES, MATERIALS, CORROSION INHIBITION, *CORROSION RESEARCH, CORROSIVE LIQUIDS, CORROSIVE GASES,) ALLOYS.

AD-271 174 62-2-2 DIV. 27
DEFENSE METALS INFORMATION CENTER, COLUMBUS, OHIO.
DESCRIPTORS: (*HEAT RESISTANT ALLOYS, *NICKEL ALLOYS FOR PRODUCTION OF *GAS TURBINES, ROTATING STRUCTURES, TURBINE BLADES, TURBINE WHEELS, GAS TURBINE ROTORS IN AUXILIARY POWER PLANTS, CENTRIFUGAL PUMPS, FUEL PUMPS OF ROCKET MOTORS, GROUND SUPPORT EQUIPMENT, GAS GENERATING SYSTEMS, RELIABILITY, EFFECTIVENESS,) BOOSTER ROCKETS.

AD-271 377 62-2-2 DIV. 26
AEROPROJECTS, INC., WEST CHESTER, PA.
DESCRIPTORS: (*REFRACTORY MATERIALS, *HEAT RESISTANT ALLOYS, *ULTRASONICS, *WELDING, SHEETS,) MOLYBDENUM ALLOYS, TITANIUM ALLOYS, NIOBIUM, TUNGSTEN, ALUMINUM, STANDING WAVE RATIOS, FOILS, TITANIUM, TANTALUM,) (WELDS, MECHANICAL PROPERTIES, TENSILE PROPERTIES, SHEAR STRESSES, DEFORMATION, FRACTURE (MECHANICS),)

AD-271 388 62-2-2 DIV. 14
DEFENSE METALS INFORMATION CENTER, COLUMBUS, OHIO.
DESCRIPTORS: (HIGH TEMPERATURE RESEARCH, *CERAMIC COATINGS AS *OXIDATION INHIBITORS FOR *REFRACTORY MATERIALS, *HEAT RESISTANT ALLOYS, METALS, MOLYBDENUM, MOLYBDENUM ALLOYS, NIOBIUM ALLOYS, TANTALUM ALLOYS, TUNGSTEN ALLOYS, VANADIUM ALLOYS,) (COATINGS OF SILICIDES, ALUMINUM COMPOUNDS, OXIDES, CERMETS, INTERMETALLIC COMPOUNDS, METAL COATINGS, BERYLLIUM COMPOUNDS,) (PROCESSING BY ELECTRODEPOSITION, CHEMICAL REACTIONS, DIFFUSION, FLAME SPRAYING,) (RE-ENTRY VEHICLES, SATELLITES, SPACESHIPS, GLIDERS, STRUCTURES, TURBOJET ENGINES, RAMJET ENGINES, ROCKET MOTORS, NUCLEAR PROPULSION,)

AD-271 571 62-2-2 DIV. 17
MICHIGAN U., ANN ARBOR.
DESCRIPTORS: (*HEAT RESISTANT ALLOYS, ALLOYS, *NICKEL ALLOYS, *COBALT ALLOYS, *CHROMIUM ALLOYS, MOLYBDENUM ALLOYS, *CREEP EFFECTS MECHANICAL PROPERTIES, MICROSTRUCTURE, PHASE STUDIES,) (HIGH TEMPERATURE RESEARCH, TEST, HARDNESS, TENSILE PROPERTIES, IMPACT SHOCK, RUPTURE, DEFORMATION, SURFACE PROPERTIES, HEAT TREATMENT,) (X-RAY DIFFRACTION ANALYSIS, ELECTRON DIFFRACTION ANALYSIS, ELECTRON MICROSCOPY, MICROSCOPY, EXTENSOMETERS, DILATOMETERS, THERMOCOUPLES,)

*HEAT RESISTANT POLYMERS

AD-271 587 62-2-2 DIV. 25
NAVAL ORDNANCE LAB., CORONA, CALIF.
DESCRIPTORS: (*TELEPHONE COMMUNICATION SYSTEMS, PANEL BOARDS (ELECTRICITY), NOISE GENERATORS, THEORY, DESIGN,) (*FERROMAGNETISM, *IRON ALLOYS, *NICKEL ALLOYS, FILMS,) (*RARE GASES, INFRARED SPECTROSCOPY, INTERFEROMETERS, ELECTROMAGNETIC WAVES, WAVE TRANSMISSION,) (*SEMICONDUCTORS, *SILICON, MAGNETO-OPTIC ROTATION,) (*HEAT RESISTANT POLYMERS, *POLYMERS, *PHOSPHINES, PHENYL RADICALS, CHLORIDES, SYNTHESIS, CHEMICAL REACTIONS,) (SOLID STATE PHYSICS, *MICROWAVE OSCILLATORS, *DIODES, *RARE EARTH COMPOUNDS, CALCIUM COMPOUNDS, FLUORIDES, *THULIUM COMPOUNDS, SPECTROPHOTOMETERS, ABSORPTION, FLUORESCENCE, CRYSTALS,) (*GUIDED MISSILE ANTENNAS, *SLOT ANTENNAS, *WAVEGUIDE SLOTS, DIELECTRICS, ANTENNA RADIATION PATTERNS, MEASUREMENT,)

*HEAT TRANSFER

AD-270 939 62-2-2 DIV. 25
SPACE SCIENCES LAB., GENERAL ELECTRIC CO., PHILADELPHIA, PA.
DESCRIPTORS: (*HEAT TRANSFER, *HYPERSONIC FLOW, *HEMISPHERICAL SHELLS,) (SHOCK TUBES, SHOCK WAVES, PLASMA PHYSICS, GASES, GAS IONIZATION, AIR, DISSOCIATION, ELECTRIC DISCHARGES, LAMINAR BOUNDARY LAYER, TRANSPORT PROPERTIES, PARTICLES, DIFFUSION,) (ATMOSPHERE ENTRY, SATELLITE VEHICLES, RE-ENTRY VEHICLES,)

AD-271 126 62-2-2 DIV. 9
STANFORD U., CALIF.
DESCRIPTORS: (*HEAT TRANSFER, *JETS, TURBULENT BOUNDARY LAYER, SURFACES, METAL PLATES, COPPER,) (EXPERIMENTAL DATA, INTEGRAL EQUATIONS,)

AD-271 417 62-2-2 DIV. 25
GENERAL ATOMIC DIV., GENERAL DYNAMICS CORP., SAN DIEGO, CALIF.
DESCRIPTORS: (*HYDROGEN, ATOMS, *OXYGEN, *HELIUM, *HEAT TRANSFER, *SCATTERING, PROTONS, *ATOMIC ENERGY LEVELS, RESONANCE,) (ION BEAMS, PHOTOELECTRIC CELLS, OSCILLOSCOPES, ELECTRON GUNS,)

AD-271 461 62-2-2 DIV. 10
FOREST SERVICE, WASHINGTON, D. C.
DESCRIPTORS: (FLUID FLOW, *HEAT TRANSFER, GASES, COMBUSTION, THERMAL CONDUCTIVITY,) (*COMBUSTION, CONVECTION, CONDUCTIVITY,) (ATMOSPHERE, STABILITY,) FOREST FIRES, PARTIAL DIFFERENTIAL EQUATIONS.

*HEATING ELEMENTS

AD-271 561 64-2-2 DIV. 26
KNIGHTS, JAMES, CO., SANDWICH, ILL.
DESCRIPTORS: (*CRYSTAL OSCILLATORS, QUARTZ CRYSTALS, GLASS SEALS, VACUUM SEALS, *SEALS, *CRYSTAL HOLDERS, *HEATING ELEMENTS, MANUFACTURING METHODS.) MINIATURE ELECTRONIC EQUIPMENT.

*HELIUM

AD-271 417 64-2-2 DIV. 25
GENERAL ATOMIC DIV., GENERAL DYNAMICS CORP., SAN DIEGO, CALIF.
DESCRIPTORS: (*HYDROGEN, ATOMS, *OXYGEN, *HELIUM, *HEAT TRANSFER, *SCATTERING, PROTONS, *ATOMIC ENERGY LEVELS, RESONANCE.) (ION BEAMS, PHOTOELECTRIC CELLS, OSCILLOSCOPES, ELECTRON GUNS.)

*HELIXES

AD-271 061 64-2-2 DIV. 2
MARINE LAB., U. OF MIAMI, CORAL GABLES, FLA.
DESCRIPTORS: (*HURRICANES, PRECIPITATION, *HELIXES, METEOROLOGICAL RADAR.)

*HEMISPHERICAL SHELLS

AD-270 935 64-2-2 DIV. 25
SPACE SCIENCES LAB., GENERAL ELECTRIC CO., PHILADELPHIA, PA.
DESCRIPTORS: (*HEAT TRANSFER, *HYPERSONIC FLOW, *HEMISPHERICAL SHELLS.) (SHOCK TUBES, SHOCK WAVES, PLASMA PHYSICS, GASES, GAS IONIZATION, AIR, DISSOCIATION, ELECTRIC DISCHARGES, LAMINAR BOUNDARY LAYER, TRANSPORT PROPERTIES, PARTICLES, DIFFUSION.) (ATMOSPHERI ENTRY, SATELLITE VEHICLES, RE-ENTRY VEHICLES.)

*HEMOPOIESIS

AD-270 970 64-2-2 DIV. 16
BAYLOR U. COLL. OF MEDICINE, HOUSTON, TEX.
DESCRIPTORS: (*RADIATION EFFECTS, *METABOLISM, *IRON AND *HEMOPOIESIS.) (*CANCER, CELLS (BIOLOGY), BLOOD, BIOCHEMICAL TESTS, ENZYME, DETECTION, THERAPY.)

*HIGH EXPLOSIVE AMMUNITION

AD-271 550 64-2-2 DIV. 22
GENERAL TECHNOLOGY CORP., ELGIN, ILL.
DESCRIPTORS: (*CYLINDRICAL BODIES, *EXPLOSIVES, *PROJECTILES, MECHANICAL PROPERTIES, STRESSES, *HIGH EXPLOSIVE AMMUNITION, DEFORMATION, DESIGN, TEST METHODS, DIGITAL COMPUTERS, (CYLINDRICAL BODIES, STRESSES, MEASUREMENT, ROTATING BANDS.)

*HIGH FREQUENCY

AD-271 192 64-2-2 DIV. 2
IONOSPHERE RESEARCH LAB., PENNSYLVANIA STATE U., UNIVERSITY PARK.
DESCRIPTORS: (MEASUREMENT OF *IONOSPHERE BY RADIO RECEPTION OF *HIGH FREQUENCY RADIO WAVES FROM SATELLITE VEHICLES.)

*HIGH PRESSURE RESEARCH

AD-271 110 64-2-2 DIV. 4
PENNSYLVANIA STATE U. MINERAL INDUSTRIES EXPERIMENT STATION, UNIVERSITY PARK.
DESCRIPTORS: (PRESSURE, CHEMICAL REACTIONS.) *HIGH PRESSURE RESEARCH.

*HIGH TEMPERATURE RESEARCH

AD-271 032 64-2-2 DIV. 9
FREE U. BERLIN (GERMANY).
DESCRIPTORS: (*SUPERAERODYNAMICS, GAS FLOW, SPHERES, *KINETIC THEORY.) (GASES, *HIGH TEMPERATURE RESEARCH.) (DISSOCIATION, SHOCK WAVES.) PARTIAL DIFFERENTIAL EQUATIONS.

AD-271 176 64-2-2 DIV. 14
GENERAL DYNAMICS/ASTRONAUTICS, SAN DIEGO, CALIF.
DESCRIPTORS: (*HIGH TEMPERATURE RESEARCH, NIOBIUM ALLOYS, *ALLOYS, *REFRACTORY MATERIALS, REFRACTORY COATINGS.) (*LOW TEMPERATURE RESEARCH, *ADHESIVES, *METAL SEALS, SEALS, MATERIALS, CERAMIC MATERIALS, GLASS, COPPER ALLOYS, SILVER ALLOYS.) (HIGH TEMPERATURE RESEARCH, HIGH PRESSURE RESEARCH, PROCESSING, MECHANICAL PROPERTIES, TENSILE PROPERTIES.)

*HUMAN ENGINEERING

AD-271 066 64-2-2 DIV. 28
BEHAVIORAL SCIENCES LAB., AEROSPACE MEDICAL DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: (*HUMAN ENGINEERING, SPACE FLIGHT.) (*SPACESHIPS, *SATELLITE VEHICLES, *MAINTENANCE, MAINTENANCE PERSONNEL, SENSORY PERCEPTION, WEIGHTLESSNESS, VISUAL ACUITY, MOTOR REACTIONS, POSITIONING REACTIONS.) (*REMOTE CONTROL SYSTEMS, TEST EQUIPMENT, DESIGN.)

AD-271 477 64-2-2 DIV. 28
NORTHROP CORP., HAWTHORNE, CALIF.
DESCRIPTORS: (*HUMAN ENGINEERING, *MAINTENANCE, *AIRCRAFT EQUIPMENT, ELECTRICAL EQUIPMENT, DESIGN, INDEXES.) (*ANTHROPOMETRY, TEST EQUIPMENT.) (AUTOMATIC, *TEST EQUIPMENT, MONITORS, TEST SETS.) HANDBOOKS.

*HURRICANES

AD-271 061 64-2-2 DIV. 2
MARINE LAB., U. OF MIAMI, CORAL GABLES, FLA.
DESCRIPTORS: (*HURRICANES, PRECIPITATION, *HELIXES, METEOROLOGICAL RADAR.)

*HYDRIDES

AD-270 957 64-2-2 DIV. 25
INSTITUTE FOR MOLECULAR PHYSICS, U. OF MARYLAND, COLLEGE PARK.
DESCRIPTORS: (*QUANTUM MECHANICS, ELECTRON TRANSITIONS, MOLECULES, IONS, *HYDRIDES, *BERYLLIUM COMPOUNDS, *CARBON COMPOUNDS, METHANES, ENERGY, THEORY, MATHEMATICAL ANALYSIS.)

*HYDROCARBONS

AD-271 105 64-2-2 DIV. 4
IONICS, INC., CAMBRIDGE, MASS.
DESCRIPTORS: (*ORGANIC COMPOUNDS, *HYDROCARBONS, LIQUIDS, *PURIFICATION, SEPARATION.) (PIXTURES, HEPTANES WITH PENTANES OR CYCLOHEXANES OR BENZENES CYCLOHEXENES, ETHERS.) (DENSITY, PRESSURE, PHYSICAL PROPERTIES, CHROMATOGRAPHIC ANALYSIS.) (SEMIPERMEABILITY, FILMS, MEMBRANES, POLYMERS, ETHYLENES OR PROPENES.)

*HYDRODYNAMICS

AD-270 990 64-2-2 DIV. 9
DAVID TAYLOR MODEL BASIN, WASHINGTON, D. C.
DESCRIPTORS: (*HYDROFOILS, FLUTTER, DETECTION, DETERMINATION.) (*HYDRODYNAMICS, RUDDER TABS, STABILITY, UNDERWATER, CONTROL SURFACES.) MARINE ENGINEERING.

AD-271 460 62-2-2 DIV. 31
J. G. ENGINEERING RESEARCH ASSOCIATES, BALTIMORE, MD.
DESCRIPTORS: (*SUBMARINE HULLS, VIBRATION, PRESSURE, *ACOUSTIC IMPEDANCE, THEORY.) (SHIP HULLS, SHIP MODELS, STRUCTURAL SHELLS, CYLINDRICAL BODIES, STRESSES, *HYDRODYNAMICS, ACOUSTICS, INTEGRAL EQUATIONS, FUNCTIONS, TRIGONOMETRY.)

*HYDROFOILS

AD-270 990 64-2-2 DIV. 9
DAVID TAYLOR MODEL BASIN, WASHINGTON, D. C.
DESCRIPTORS: (*HYDROFOILS, FLUTTER, DETECTION, DETERMINATION.) (*HYDRODYNAMICS, RUDDER TABS, STABILITY, UNDERWATER, CONTROL SURFACES.) MARINE ENGINEERING.

*HYDROGEN

AD-271 417 64-2-2 DIV. 25
GENERAL ATOMIC DIV., GENERAL DYNAMICS CORP., SAN DIEGO, CALIF.
DESCRIPTORS: (*HYDROGEN, ATOMS, *OXYGEN, *HELIUM, *HEAT TRANSFER, *SCATTERING, PROTONS, *ATOMIC ENERGY LEVELS, RESONANCE.) (ION BEAMS, PHOTOELECTRIC CELLS, OSCILLOSCOPES, ELECTRON GUNS.)

*HYDROLOGY

AD-271 543 64-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*HYDROLOGY, OCEANS, ARCTIC REGIONS.) (*OCEANOGRAPHICAL DATA, COLLECTING METHODS, USSR.) (OCEANOGRAPHICAL CHARTS, KARA SEA.)

*HYPERSONICS

AD-270 927 64-2-2 DIV. 27
REPUBLIC AVIATION CORP., FARMINGDALE, N. Y.
DESCRIPTORS: (ROCKET MOTORS, *HYPERSONICS, ROCKET PROPELLANTS, HYPERVELOCITY VEHICLES.) (*ROCKET PROPELLANTS, DETONATION, HEAT OF REACTION, DISSOCIATION, RECOMBINATION REACTIONS, HYDROGEN, AIR, NITROGEN, ACETYLENES.) (ATMOSPHERE MODELS, IONOSPHERE MODELS.)

AD-271 470 64-2-2 DIV. 25
UTAH U., SALT LAKE CITY.
DESCRIPTORS: (*PARTICLES, *PELLETS, *HYPERSONICS, VELOCITY, *IMPACT SHOCK, METEOROLOGY, PARTICLE ACCELERATORS, *METALS.) (SATELLIT VEHICLES, EROSION.) (PELLETS, ACCELERATION.) (PARTICLES, HYDROGEN, ATOMS, SCATTERING, COPPER, ARGON.) FEASIBILITY STUDIES, SPECTROGRAPHIC ANALYSIS.

*HYPERVELOCITY GUNS

AD-271 519 64-2-2 DIV. 9
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*HYPERVELOCITY GUNS, HYPERVELOCITY PROJECTILES, LAUNCHING, SIMULATION.) (*TERMINAL BALLISTICS, GAS DISCHARGES.)

*HYPERVELOCITY PROJECTILES

AD-270 930 64-2-2 DIV. 22
BUREAU OF MINES, PITTSBURGH, PA.
DESCRIPTORS: (*HYPERVELOCITY PROJECTILES, AMMUNITION FRAGMENTS, PARTICLES, HYPERSONICS, TERMINAL BALLISTICS, EFFECTIVENESS, ALUMINUM ALLOYS, ALLOYS, METAL PLATES, SHEETS, FAILURE (MECHANICS), *PENETRATION, *CRATERING, SPALLATION.) (ANALYSIS OF CRATERING OF HYPERVELOCITY PROJECTILES.) (TEST EQUIPMENT FOR ACCELERATION OF HYPERVELOCITY PROJECTILS, DESIGN.)

*HYPERVELOCITY VEHICLES

AD-271 575 62-2-2 DIV. 9
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*RE-ENTRY VEHICLES, *HYPERVELOCITY VEHICLES, AERODYNAMIC CONFIGURATIONS, TRIANGULAR WINGS, WIND TUNNEL MODELS, MODEL TESTS, AERODYNAMICS, *RE-ENTRY AERODYNAMICS, STABILITY, CONTROL, STABILITY (LATERAL), STABILITY (LONGITUDINAL), ROLL, DAMPING.)

*IGNITION

AD-270 941 62-2-2 DIV. 10
RESEARCH INST., TEMPLE U., PHILADELPHIA, PA.
DESCRIPTORS: (*LIQUID ROCKET PROPELLANTS, *ROCKET OXIDIZERS, ROCKET FUELS, CHEMICAL PROPERTIES, COMBUSTION, *IGNITION, STABILITY, SPECIFIC IMPULSE, THEORY.) (LIQUEFIED GASES OXYGEN, OXYGEN COMPOUNDS, OZONE, FLUORIDES, PENTABORANES, DIBORANES, FLUORINE.) (ROCKET MOTORS, MODEL TESTS, TEST METHODS, TEST EQUIPMENT, DESIGN.)

*IMPACT SHOCK

AD-271 470 64-2-2 DIV. 25
UTAH U., SALT LAKE CITY.
DESCRIPTORS: (*PARTICLES, *PELLETS, *HYPERSONICS, VELOCITY, *IMPACT SHOCK, METEOROLOGY, PARTICLE ACCELERATORS, *METALS.) (SATELLIT VEHICLES, EROSION.) (PELLETS, ACCELERATION.) (PARTICLES, HYDROGEN, ATOMS, SCATTERING, COPPER, ARGON.) FEASIBILITY STUDIES, SPECTROGRAPHIC ANALYSIS.

*IMPEDANCE MATCHING

AD-271 619 62-2-2 DIV. 8
RADIO CORP. OF AMERICA, LANCASTER, PA.
DESCRIPTORS: (*TETRODES, *POWER AMPLIFIERS, RADIOFREQUENCY POWER, VERY HIGH FREQUENCY.) (CIRCUITS, DESIGN, VERY HIGH FREQUENCY.) *IMPEDANCE MATCHING.

*INCENDIARY BOMBS

AD-271 598 64-2-2 DIV. 3
AIR FORCE PROVING GROUND COMMAND, EGLIN AIR FORCE BASE, FLA.
DESCRIPTORS: (*FIRE BOMBS, *INCENDIARY BOMBS, *BOMB FUZES, *ELECTRIC FUZES, PROCESSING, LOADING, RELIABILITY, FLIGHT TESTING, SAFETY, TEMPERATURE, PRESSURE, TESTS.)

*INDIUM COMPOUNDS

AD-271 469 64-2-2 DIV. 25
NAVAL ORDNANCE LAB., WHITE OAK, MD.
DESCRIPTORS: (*SEMICONDUCTORS, *INDIUM COMPOUNDS, *GALLIUM COMPOUNDS, *ARSENIDES, *ANTIMONIDES, INTERMETALLIC COMPOUNDS, OPTICS, REFLECTION, REFRACTIVE INDEX, REFRACTIVE PROPERTIES, LIGHT, ABSORPTION, MATHEMATICAL ANALYSIS, INTEGRAL EQUATIONS.) (ULTRAVIOLET SPECTROSCOPY, INFRARED SPECTROSCOPY, SPECTROPHOTOMETERS, PHOTOMULTIPLIERS.)

*INDUSTRIAL EQUIPMENT

AD-271 473 62-2-2 DIV. 17
GOODYEAR AIRCRAFT CORP., AKRON, OHIO.
DESCRIPTORS: (*METALLIC TEXTILES, THREADS, STAINLESS STEEL, NICKEL ALLOYS, CHROMIUM ALLOYS, COBALT ALLOYS, MANUFACTURING METHODS, PRODUCTION, *INDUSTRIAL EQUIPMENT, DESIGN.) (RE-ENTRY VEHICLES, STRUCTURES.)

*INDUSTRIAL PSYCHOLOGY

AD-271 149 62-2-2 DIV. 28
EDUCATIONAL TESTING SERVICE, PRINCETON, N. J.
DESCRIPTORS: (*INDUSTRIAL PSYCHOLOGY, *MILITARY PSYCHOLOGY, *RECRUITING, MILITARY PERSONNEL, PSYCHOMETRICS, MATHEMATICAL ANALYSIS, COMBINATORIAL ANALYSIS, EFFECTIVENESS.)

AD-271 387 62-2-2 DIV. 28
EDUCATIONAL TESTING SERVICE, PRINCETON, N. J.
DESCRIPTORS: (*INDUSTRIAL PSYCHOLOGY, ACHIEVEMENT TESTS, APTITUDE TESTS, *PERSONALITY TESTS, *FACTOR ANALYSIS, JOB ANALYSIS, TEST METHODS.) (BEHAVIOR, ATTITUDES, LEADERSHIP.)

AD-271 388 62-2-2 DIV. 20
EDUCATIONAL TESTING SERVICE, PRINCETON, N. J.
DESCRIPTORS: (*INDUSTRIAL PSYCHOLOGY, *PERSONALITY, *PERSONALITY TESTS, BEHAVIOR, ACHIEVEMENT TESTS, RELIABILITY.)

*INERTIAL GUIDANCE

AD-271 542 62-2-2 DIV. 12
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: SUBSTITUTES FOR GYROSCOPES IN *INERTIAL GUIDANCE, *INERTIAL NAVIGATION, *GUIDANCE, *CONTROL SYSTEMS, USSR.

*INERTIAL NAVIGATION

AD-271 542 62-2-2 DIV. 12
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: SUBSTITUTES FOR GYROSCOPES IN *INERTIAL GUIDANCE, *INERTIAL NAVIGATION, *GUIDANCE, *CONTROL SYSTEMS, USSR.

*INFORMATION THEORY

AD-271 107 62-2-2 DIV. 8
JOHNS HOPKINS U. SCHOOL OF ENGINEERING, BALTIMORE, MD.
DESCRIPTORS: (*INFORMATION THEORY, *RADIO-FREQUENCY FILTERS, RADIO SIGNALS, CIRCUITS, ELECTRICAL NETWORKS.) (VECTOR ANALYSIS, APPLIED MATHEMATICS, SERIES, TRANSFORMATION (MATHEMATICS).)

*INFRARED COMMUNICATION SYSTEMS

AD-271 158 62-2-2 DIV. 25
ANTENNA LAB., OHIO STATE U. RESEARCH FOUNDATION, COLUMBUS.
DESCRIPTORS: (*INFRARED RADIATION, MOLECULS, NITROGEN, IONS, *PLASMA PHYSICS.) (NITROGEN, MOLECULES, MOLECULAR STRUCTURE, OSCILLATION) (INFRARED RESEARCH, *INFRARED COMMUNICATION SYSTEMS.) (QUANTUM MECHANICS, ELECTROMAGNETIC WAVES.)

*INFRARED DETECTORS

AD-271 511 62-2-2 DIV. 8
NAVAL SUPERSONIC LAB., MASS. INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*BAND-PASS FILTERS, *ACOUSTIC FILTERS, NARROWBAND, MINIATURE ELECTRONIC EQUIPMENT, DESIGN.) (*AUDIO AMPLIFIERS, *INFRARED DETECTORS, SIGNAL-TO-NOISE RATIO, NOISE (RADIO), REDUCTION, EFFECTIVENESS, THEORY, MATHEMATICAL ANALYSIS.)

*INFRARED FILTERS

AD-271 358 62-2-2 DIV. 7
SPECTROLAB, INC., NORTH HOLLYWOOD, CALIF.
DESCRIPTORS: (SATELLITE VEHICLES, POWER SUPPLIES, SILICON, *SOLAR CELLS, *OPTICAL COATINGS, *INFRARED FILTERS, THEORY.) (TESTS, THERMODYNAMICS, WAVE TRANSMISSION, REFLECTION, BLACKBODY RADIATION, SPACE ENVIRONMENTAL CONDITIONS, STABILITY, RADIATION EFFECTS, BETA PARTICLES, INFRARED RADIATION.) (RARE EART, *RARE EARTH COMPOUNDS, FLUORIDES, OXYFLUORIDES.) (COATINGS, VAPOR PLATING.) (RESIN ADHESIVES, BONDING.)

*INFRARED PULSES

AD-270 952 62-2-2 DIV. 25
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKYN.
DESCRIPTORS: (*INFRARED PULSES, *THERMAL RADIATION, ATOMIC BOMB EXPLOSIONS, SIMULATION, GENERATORS, DESIGN.)

*INFRARED RADIATION

AD-271 158 62-2-2 DIV. 25
ANTENNA LAB., OHIO STATE U. RESEARCH FOUNDATION, COLUMBUS.
DESCRIPTORS: (*INFRARED RADIATION, MOLECULS, NITROGEN, IONS, *PLASMA PHYSICS.) (NITROGEN, MOLECULES, MOLECULAR STRUCTURE, OSCILLATION) (INFRARED RESEARCH, *INFRARED COMMUNICATION SYSTEMS.) (QUANTUM MECHANICS, ELECTROMAGNETIC WAVES.)

*INFRARED SPECTROSCOPY

AD-271 086 62-2-2 DIV. 16
DENTAL RESEARCH FACILITY, NAVAL TRAINING CENTER, GREAT LAKES, ILL.
DESCRIPTORS: (*SALIVA, *INFRARED SPECTROSCOPY, MAN, ABSORPTION, MEASUREMENT, IMMUNIZATION.) (*DENTAL PLAQUES, *DENTAL CARIES, CHEMICAL ANALYSIS.)

AD-271 087 62-2-2 DIV. 16
DENTAL RESEARCH FACILITY, NAVAL TRAINING CENTER, GREAT LAKES, ILL.
DESCRIPTORS: (*SALIVA, *INFRARED SPECTROSCOPY, MAN, DETECTION, CHEMICAL PROPERTIES, ABSORPTION.) (*BICARBONATES, BIOCHEMICAL TESTS.)

*INSTRUMENT LANDINGS

AD-271 547 62-2-2 DIV. 30
FEDERAL AVIATION AGENCY, WASHINGTON, D. C.
DESCRIPTORS: (*AIR TRAFFIC, *INSTRUMENT LANDINGS, NEW YORK, *AIR TRAFFIC CONTROL SYSTEMS, DATA PROCESSING SYSTEMS, DISPLAY SYSTEMS, ANALYSIS.)

*INSULATING MATERIALS

AD-271 112 62-2-2 DIV. 12
NAVAL ORDNANCE LAB., WHITE OAK, MD.
DESCRIPTORS: (HIGH TEMPERATURE RESEARCH, TEST EQUIPMENT, TEST METHODS, *THERMAL INSULATION, HEAT, *INSULATING MATERIALS, HEAT RESISTANT POLYMERS, REFRACTORY MATERIALS, *ABLATION, *GUIDED MISSILES, *RE-ENTRY VEHICLES, *ROCKET CASES, *ROCKET MOTOR NOZZLES,) (MEASUREMENT, TEMPERATURE, THERMAL DIFFUSION, MATHEMATICAL ANALYSIS.) (OXYGEN, ACETYLENES, WELDING, FLAMES.)

*INTEGRAL EQUATIONS

AD-271 136 62-2-2 DIV. 15
INSTITUTE FOR FLUID DYNAMICS AND APPLIED MATHEMATICS, U. OF MARYLAND, COLLEGE PARK.
DESCRIPTORS: (*INTEGRAL EQUATIONS, *MATRIX ALGEBRA, INEQUALITIES, PARTIAL DIFFERENTIAL EQUATIONS.)

AD-271 607 62-2-2 DIV. 9
BOEING SCIENTIFIC RESEARCH LABS., SEATTLE, WASH.
DESCRIPTORS: (*FLUID FLOW, ELASTICITY, STABILITY, TENSILE PROPERTIES, DAMPING.) (*INTEGRAL EQUATIONS, *REYNOLDS NUMBER.)

*INTELLIGIBILITY

AD-271 606 62-2-2 DIV. 25
BOLT, BERANEK, AND NEWMAN, INC., CAMBRIDGE, MASS.
DESCRIPTORS: (*SPEECH, *INTELLIGIBILITY, MEASUREMENT.) (AUDIOFREQUENCY, SIGNAL TO NOISE RATIO, NOISE, DETERMINATION.)

*INTERMEDIATE FREQUENCY AMPLIFIERS

AD-271 086 62-2-2 DIV. 8
LOCKHEED MICROSYSTEMS ELECTRONICS, SUNNYVALE, CALIF.
DESCRIPTORS: (*INTERMEDIATE FREQUENCY AMPLIFIERS, *ELECTRONIC CIRCUITS, *THIN FILMS, ELECTRODES, *ELECTROSTATIC CAPACITANCE, DIELECTRICS.) (THIN FILMS, THICKNESS, RESISTANCE, ELECTROSTATIC CAPACITANCE, TEMPERATURE, DIELECTRIC PROPERTIES.)

*ION ROCKETS

AD-271 510 62-2-2 DIV. 27
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON, D. C.
DESCRIPTORS: (MOLYBDENUM, WIRE SCREENS, *ION ACCELERATORS, ELECTRON BOMBARDMENT, MERCURY, ION BEAMS FOR *ION ROCKETS, ELECTRIC PROPULSION, TESTS.)

*IONOSPHERE

AD-271 192 62-2-2 DIV. 2
IONOSPHERE RESEARCH LAB., PENNSYLVANIA STATE U., UNIVERSITY PARK.
DESCRIPTORS: (MEASUREMENT OF *IONOSPHERE BY RADIO RECEPTION OF *HIGH FREQUENCY, RADIO WAVES FROM SATELLITE VEHICLES.)

AD-271 512 62-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*IONOSPHERE, IONIZATION,) (*AURORAE, NIGHT SKY, LUMINESCENCE.) (*SOLAR CORONA, SOLAR FLARES, POLARIZATION,) VAN ALLEN RADIATION BELT, *COSMIC RAYS, *ATMOSPHERIC ELECTRICITY, *PLASMA PHYSICS.

AD-271 513 62-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*SUNSPOTS, HYRODYNAMICS,) (SUNSPOTS, THEORY,) (IONOSPHERIC DISTURBANCES, SOLAR FLARES,) (*IONOSPHERE, IONIZATION,) (IONOSPHERE, TERRESTRIAL MAGNETISM,) (*AURORAE, ANTARCTIC REGIONS,) (AURORAE, MEASUREMENT, RADAR, PHOTOMETERS, SPECTROGRAPHIC ANALYSIS, PHOTOGRAPHIC ANALYSIS,) (*EARTH, *ELECTRIC CURRENTS,) SOLAR ATMOSPHERE, *COSMIC RAYS, *ATMOSPHERIC ELECTRICITY.

AD-271 576 62-2-2 DIV. 2
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*IONOSPHERE, ELECTRONS, DENSITY, MEASUREMENT BY RADIO TRANSMISSION, RADIO WAVES, PROPAGATION FROM SOUNDING ROCKETS, TESTS, MATHEMATICAL ANALYSIS.)

*IONS

AD-270 926 62-2-2 DIV. 27
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*CYLINDRICAL BODIES, COATING, *METAL FILM, *IONS, ELECTROSTATICS, ANALYSIS, *ELECTRIC PROPULSION, ROCKET MOTORS,) (CESIUM, VAPORS, IONIZATION) (PLATINUM, TANTLUM, WIRE, HEATING, DENSITY, SPACE CHARGES,) (DIFFERENTIAL EQUATIONS, INTEGRAL EQUATIONS,) ION SOURCES.

AD-271 360 62-2-2 DIV. 10
TEXACO EXPERIMENT, INC., RICHMOND, VA.
DESCRIPTORS: (*RECOMBINATION REACTIONS, *REACTION KINETICS, *IONS, *FLAMES, COMBUSTION,) (CHEMICAL REACTIONS, TEMPERATURE, PRESSURE, GASES, TESTS, THEORY,) (HYDROXIDES, TRITIUM OXIDE, IONS,) (METHANES, PROPANES, ACETYLENES, CHLORINE,)

AD-271 434 62-2-2 DIV. 25
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.
DESCRIPTORS: (AIR, *ELECTRONS, *IONS, *OXYGEN, ATOMS,) (ATMOSPHERE, ELECTRICAL PROPERTIES,) (ELECTRONS, DRIFT, MEASUREMENT.)

*IRON

AD-270 970 62-2-2 DIV. 16
BAYLOR U. COLL. OF MEDICINE, HOUSTON, TEX.
DESCRIPTORS: (*RADIATION EFFECTS, *METABOLISM, *IRON AND *HEMOPOIESIS,) (*CANCER, CELLS (BIOLOGY), BLOOD, BIOCHEMICAL TESTS, ENZYME, DETECTION, THERAPY,)

*IRON ALLOYS

AD-270 908 62-2-2 DIV. 17
ILLINOIS U., URBANA.
DESCRIPTORS: (*IRON ALLOYS, NICKEL ALLOYS, *AUSTENITE, *MARTENSITE, *PHASE TRANSITIONS PHASE STUDIES, MICROSTRUCTURE, CRYSTAL STRUCTURE, LATTICES, TRANSITION TEMPERATURE, X-RAY DIFFRACTION ANALYSIS,) ALLOYS.

AD-271 380 62-2-2 DIV. 17
MANUFACTURING LABS., INC., CAMBRIDGE, MASS.
DESCRIPTORS: (HIGH PRESSURE RESEARCH, HIGH TEMPERATURE RESEARCH, METALLURGY, *PHASE STUDIES,) (HYDROSTATIC PRESSURE, PHASE TRANSITIONS, *IRON ALLOYS, CHROMIUM ALLOYS, NICKEL ALLOYS, SILICON ALLOYS,) (IRON ALLOYS, *CARBON ALLOYS, AUSTENITE,) (*MOLYBDENUM COMPOUNDS, *CARBIDES, SYNTHESIS,) (COPPER, *BRASS, MICROSTRUCTURE, STRESSES, REACTION KINETICS, RELAXATION TIME,) (*ALUMINUM COMPOUNDS, OXIDES, SINTERING,) (CERIUM, HALL EFFECT, MEASUREMENT,) BRITTLE MATERIALS, ALLOYS, METALS, TEST EQUIPMENT, X-RAY DIFFRACTION ANALYSIS.

AD-271 587 62-2-2 DIV. 25
NAVAL ORDNANCE LAB., CORONA, CALIF.
DESCRIPTORS: (*TELEPHONE COMMUNICATION SYSTEMS, PANEL BOARDS (ELECTRICITY), NOISE GENERATORS, THEORY, DESIGN,) (*FERROMAGNETISM, *IRON ALLOYS, *NICKEL ALLOYS, FILMS,) (*RARE GASES, INFRARED SPECTROSCOPY, INTERFEROMETERS, ELECTROMAGNETIC WAVES, WAVE TRANSMISSION,) (*SEMICONDUCTORS, *SILICON, MAGNETO-OPTIC RCTATION,) (*HEAT RESISTANT POLYMERS, *POLYMERS, *PHOSPHINES, PHENYL RADICALS, CHLORIDES, SYNTHESIS, CHEMICAL REACTIONS,) (SOLID STATE PHYSICS, *MICROWAVE OSCILLATORS, *DIODES, *RARE EARTH COMPOUNDS, CALCIUM COMPOUNDS, FLUORIDES, *THULIUM COMPOUNDS, SPECTROPHOTOMETERS, ABSORPTION, FLUORESCENCE, CRYSTALS,) (*GUIDED MISSILE ANTENNAS, *SLOT ANTENNAS, *WAVEGUIDE SLOTS, DIELECTRICS, ANTENNA RADIATION PATTERNS, MEASUREMENT,)

*JET ENGINE FUELS

AD-271 466 62-2-2 DIV. 10
LITTLE, ARTHUR D., CAMBRIDGE, MASS.
DESCRIPTORS: (*JET ENGINE FUELS, AVIATION FUELS, ROCKET FUELS, *LIQUID ROCKET PROPELLANTS, CONTAMINATION, IMPURITIES, WATER, SOLIDS, PARTICLES, PURIFICATION, SEPARATION, TESTS,) FUEL FILTERS, *CENTRIFUGE SEPARATION, *ELECTROSTATIC PRECIPITATION,)

*JET ENGINES

AD-271 416 62-2-2 DIV. 27
GENERAL ELECTRIC CO., WEST LYNN, MASS.
DESCRIPTORS: (*THERMOCOUPLES, DESIGN, RECORDING DEVICES FOR MEASUREMENT OF *JET ENGINES, TURBOJET ENGINES, AGING,) (ELECTRICAL CONDUCTANCE ON THERMAL DIFFUSION, METAL FILMS IN EXHAUST GASES,) (BONDING, THIN FILMS OF CHROMIUM, IRON, PALLADIUM, PLATINUM, GOLD, SILVER, TESTS, PREPARATION, MANUFACTURING METHODS,)

*JET FIGHTERS

AD-271 119 62-2-2 DIV. 1
NAVAL WEAPONS LAB., DAHLGREN, VA.
DESCRIPTORS: (*JETTISONABLE COCKPITS, SEPARATION BY EXPLOSIVE ACTUATORS, RELEASE MECHANISTUDIES,) (NAVAL AIRCRAFT, *JET FIGHTERS, AVIATION SAFETY,)

*JETS

AD-270 923 62-2-2 DIV. 9
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*JETS, *NOZZLES, THRUST, FLUID MECHANICS,)

AD-271 126 62-2-2 DIV. 9
STANFORD U., CALIF.
DESCRIPTORS: (*HEAT TRANSFER, *JETS, TURBULENT BOUNDARY LAYER, SURFACES, METAL PLATES, COPPER,) (EXPERIMENTAL DATA, INTEGRAL EQUATIONS,)

*JETTISONABLE COCKPITS

AD-271 119 62-2-2 DIV. 1
NAVAL WEAPONS LAB., DAHLGREN, VA.
DESCRIPTORS: (*JETTISONABLE COCKPITS, SEPARATION BY EXPLOSIVE ACTUATORS, RELEASE MECHANISTUDIES,) (NAVAL AIRCRAFT, *JET FIGHTERS, AVIATION SAFETY,)

*JOB ANALYSIS

AD-271 372 62-2-2 DIV. 23
PERSONNEL LAB., AERONAUTICAL SYSTEMS DIV., LACKLAND AIR FORCE BASE, TEX.
DESCRIPTORS: (*JOB ANALYSIS, *BIBLIOGRAPHY, AIR FORCE.) (PERSONNEL, CLASSIFICATION.)

AD-271 483 62-2-2 DIV. 23
PSYCHOLOGICAL RESEARCH ASSOCIATES, INC., ARLINGTON, VA.
DESCRIPTORS: (*TRAINING, *MILITARY TRAININ, *SELECTION OF TRAINING DEVICES, EFFECTIVENESS.) (*JOB ANALYSIS, AVIATION PERSONNEL.)

*JUPITER

AD-270 931 62-2-2 DIV. 2
RADIO OBSERVATORY, CALIF. INST. OF TECH., OWENS VALLEY, CALIF.
DESCRIPTORS: (*JUPITER, *EXTRATERRESTRIAL RADIO WAVES, INTENSITY, POLARIZATION, MEASUREMENT.)

*KINETIC THEORY

AD-271 032 62-2-2 DIV. 9
FREE U. BERLIN (GERMANY).
DESCRIPTORS: (*SUPERAERODYNAMICS, GAS FLOW, SPHERES, *KINETIC THEORY.) (GASES, *HIGH TEMPERATURE RESEARCH.) (DISSOCIATION, SHOCK WAVES.) PARTIAL DIFFERENTIAL EQUATIONS.

*KLYSTRONS

AD-271 177 62-2-2 DIV. 8
GENERAL ELECTRIC CO., SYRACUSE, N. Y.
DESCRIPTORS: (*KLYSTRONS, MICROWAVE EQUIPMENT, X BAND, *ELECTRON BEAMS, SPACE CHARGES, SECONDARY EMISSION, ELECTRONS, ELECTRODES.) ELECTRON TUBES.

*LABORATORY ANIMALS

AD-271 441 62-2-2 DIV. 16
HAZELTON LABS., INC., FALLS CHURCH, VA.
DESCRIPTORS: (*VETERINARY MEDICINE, *LABORATORY ANIMALS, PRIMATES, ANIMAL INDUSTRY.) (MEDICAL LABORATORIES, OPERATION, MAINTENANCE, HOUSING, ECOLOGY, SURVIVAL.)

*LABORATORY EQUIPMENT

AD-271 506 62-2-2 DIV. 30
PHYSICS LAB., AERONAUTICAL SYSTEMS DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: (*MAGNETOMETERS, DESIGN, CALIBRATION.) (*MAGNETIC FIELDS, THEORY, HALL EFFECT, MATHEMATICAL ANALYSIS.) (INDIUM COMPOUNDS, ARSENIDES, SENSITIVITY TO MAGNETIC FIELDS.) *LABORATORY EQUIPMENT.

*LAMINAR BOUNDARY LAYER

AD-271 175 62-2-2 DIV. 9
STANFORD U., CALIF.
DESCRIPTORS: (SHEETS, *LAMINAR BOUNDARY LAYER, TRANSITION TEMPERATURE, CONFIGURATION, GAS FLOW, WEDGES, SEPARATION.) (*TURBULENT FLO, FRICTION, SMOKES, DYES, OSCILLATIONS.) (MECHANICS, THEORY, HYDRODYNAMICS, STABILITY, ANEMOMETERS, NON-LINEAR SYSTEMS, FEASIBILITY STUDIES, MEASUREMENT.)

*LANGUAGE

AD-270 908 62-2-2 DIV. 26
SCHOOL OF AEROSPACE MEDICINE, BROOKS AIR FORCE BASE, TEX.
DESCRIPTORS: (*VISUAL PERCEPTION, STIMULATION, *PSYCHOMETRICS.) (*LANGUAGE, THEORY.) FACTOR ANALYSIS.

AD-271 178 62-2-2 DIV. 32
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
DESCRIPTORS: (ANALYSIS OF AUTOMATIC, *LANGUAGE, TRANSLATIONS.) DICTIONARIES, PROGRAMMING, CODING, *MACHINE TRANSLATION, USSR, DATA PROCESSING SYSTEMS.

*LEAD COMPOUNDS

AD-270 906 62-2-2 DIV. 25
HAMPOND METALLURGICAL LAB., YALE U., NEW HAVEN, CONN.
DESCRIPTORS: (*LEAD COMPOUNDS, *SULFIDES, *SINGLE CRYSTALS, GROWTH, CHEMICAL IMPURITIS, DEFORMATION, PLASTICITY, DENSITY.) (FRACTURE (MECHANICS), REACTION KINETICS, STRESSES, PRISMS, POLAMIZATION, MECHANICAL PROPERTIES.) MICROPHOTOGRAPHY.

*LEARNING

AD-271 150 62-2-2 DIV. 23
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: *TEACHING MACHINES, *BIBLIOGRAPHY, *TRAINING DEVICES, *LEARNING, *EDUCATION, *MILITARY TRAINING.

*LIGHT

AD-271 092 62-2-2 DIV. 30
BARTLEY, S. O., LA JOLLA, CALIF.
DESCRIPTORS: (*UNDERWATER, *LIGHT, MEASUREMENT, *PHOTOMETERS.)

AD-271 098 62-2-2 DIV. 25
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*LIGHT, *ABSORPTION, WATER, DETERMINATION, INSTRUMENTATION, MEASUREMENT, OCEANS, LAKES.) (RECORDING DEVICES, DATA PROCESSING SYSTEMS.) (PHOTOTUBES, INSTRUMENTATION.) (UNDERWATER PHOTOGRAPHY, UNDERWATER TELEVISION SYSTEMS.) PHOTOELECTRIC TRANSDUCERS.

*LINEAR SYSTEMS

AD-271 038 62-2-2 DIV. 15
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*FUNCTIONS, *MATHEMATICAL LOGIC, LATTICES, *LINEAR SYSTEMS, NUMBER THEORY, INEQUALITIES, REAL VARIABLES, COMPLEX VARIABLES, ALGEBRA.)

AD-271 534 62-2-2 DIV. 25
BROWN U. DIV. OF APPLIED MATHEMATICS, PROVIDENCE, R. I.
DESCRIPTORS: (*ELASTICITY, VISCOSITY, *SOLIDS, *LINEAR SYSTEMS, STRESSES, DEFORMATION.) (MATHEMATICAL ANALYSIS, STRESSES, PARTIAL DIFFERENTIAL EQUATIONS.)

*LIQUID ROCKET PROPELLANTS

AD-270 961 62-2-2 DIV. 10
RESEARCH INST., TEMPLE U., PHILADELPHIA, PA.
DESCRIPTORS: (*LIQUID ROCKET PROPELLANTS, *ROCKET OXIDIZERS, ROCKET FUELS, CHEMICAL PROPERTIES, COMBUSTION, *IGNITION, STABILITY, SPECIFIC IMPULSE, THEORY.) (LIQUEFIED GASES OXYGEN, OXYGEN COMPOUNDS, OZONE, FLUORIDES, PENTABORANES, DIBORANES, FLUORINE.) (ROCKET MOTORS, MODEL TESTS, TEST METHODS, TEST EQUIPMENT, DESIGN.)

AD-270 973 62-2-2 DIV. 10
LITTLE, ARTHUR D., INC., CAMBRIDGE, MASS.
DESCRIPTORS: (*LIQUID ROCKET PROPELLANTS, SATELLITE VEHICLES, SPACESHIPS, *STORAGE, PROPELLANT TANKS, THERMAL RADIATION, ATTENUATION, *THERMAL INSULATION, LAMINATES, FOILS ALUMINUM, GLASS TEXTILES, PLASTICS, THERMAL CONDUCTIVITY, HEAT TRANSFER, BOILING, MATHEMATICAL ANALYSIS.) (RADIATION EFFECTS, SHIELDING, FEASIBILITY STUDIES, THEORY.)

AD-270 974 62-2-2 DIV. 10
LITTLE, ARTHUR D., INC., CAMBRIDGE, MASS.
DESCRIPTORS: (*LIQUID ROCKET PROPELLANTS, *SPACE ENVIRONMENTAL CONDITIONS, STORAGE, THERMAL RADIATION, THERMAL INSULATION, CRATERING, IMPACT SHOCK, IONIZATION, RADIATION DAMAGE, HEAT TRANSFER, PROPELLANT TANKS, SPALLATION, THERMAL CONDUCTIVITY, (*SPACE FLIGHT, *SATELLITE VEHICLES, HYPERVELOCITY VEHICLES, METEORS, HAZARDS.)

AD-271 034 62-2-2 DIV. 27
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*BIBLIOGRAPHY, *MATERIALS, METALS, *CONTAINERS, *LIQUID ROCKET PROPELLANTS, LIQUEFIED GASES.) (HYDROGEN, FLUORINE, HYDRAZINES, NITROGEN COMPOUNDS, TETROXIDES.)

AD-271 373 62-2-2 DIV. 10
AIR PRODUCTS AND CHEMICALS, INC., ALLENTOWN, PA.
DESCRIPTORS: (*OXYGEN, *LIQUEFIED GASES, *LIQUID ROCKET PROPELLANTS, ROCKET OXIDIZERS, CONTAMINATION, PURIFICATION, CHEMICAL IMPURITIES, HYDROCARBONS, SOLIDIFIED GASES, CARBON DIOXIDE, HANDLING, SAFETY, *FUEL FILTERS, DESIGN.)

AD-271 466 62-2-2 DIV. 10
LITTLE, ARTHUR D., CAMBRIDGE, MASS.
DESCRIPTORS: (*JET ENGINE FUELS, AVIATION FUELS, ROCKET FUELS, *LIQUID ROCKET PROPELLANTS, CONTAMINATION, IMPURITIES, WATER, SOLIDS, PARTICLES, PURIFICATION, SEPARATION, TESTS.) (FUEL FILTERS, *CENTRIFUGE SEPARATION, *ELECTROSTATIC PRECIPITATION.)

AD-271 597 62-2-2 DIV. 10
ARMOUR RESEARCH FOUNDATION, CHICAGO, ILL.
DESCRIPTORS: (*LIQUID ROCKET PROPELLANTS, *NITROGLYCERINE, SENSITIVITY, DETONATION, TESTS.) (TEST METHODS, VAPOR PRESSURE, SURFACE TENSION, HEATING, HEAT TRANSFER, *PHOTOLYSIS, XENON LAMPS, INFRARED RADIATION, ULTRAVIOLET RADIATION, *PHOTOCHEMICAL REACTIONS.) (ABSORPTION, WATER.) (TIME, TEMPERATURE, PRESSURE, SHOCK TUBES.)

*LOAD DISTRIBUTION

AD-270 969 62-2-2 DIV. 25
BROWN U. DIV. OF APPLIED MATHEMATICS, PROVIDENCE, R. I.
DESCRIPTORS: (*STRUCTURAL SHELLS, ELASTIC SHELLS, CYLINDRICAL BODIES, *LOAD DISTRIBUTION, LOADING.) (STRUCTURAL SHELLS, DEFORMATION, DEFLECTION, SOUND, ACOUSTICS, SHOCK WAVES.) (STRESSES, MATHEMATICAL ANALYSIS.)

*LOW PASS FILTERS

AD-271 117 62-2-2 DIV. 8
NAVAL ORDNANCE TEST STATION, CHINA LAKE, CALIF.
DESCRIPTORS: (*RADIOFREQUENCY FILTERS, *LOW-PASS FILTERS, SUPPRESSORS, *RADIATION HAZARDS, DESIGN.) (EXPLOSIONS, EXPLOSIVE ACTUATORS, *ORDNANCE, *SAFETY, ELECTRIC IGNITERS, FIRING CIRCUITS, ELECTROMAGNETIC FIELDS, ELECTRICAL NETWORKS, RADIO INTERFERENCE, REDUCTION.)

*LOW TEMPERATURE RESEARCH

AD-271 000 62-2-2 DIV. 25
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: (*CRYOGENICS, *LOW TEMPERATURE RESEARCH, *SUPERCONDUCTIVITY, THERMODYNAMICS, TRANSPORT PROPERTIES.) (ROCKET FUELS, LIQUID ROCKET PROPELLANTS, ROCKET OXIDIZERS, LIQUEFIED GASES, FLUORINE, HYDROGEN, OXYGEN, NITROGEN, OZONE.) (HAZARDS, HANDLING, STORAGE.) (GUIDED MISSILES, SURFACE TO SURFACE, SATELLITE VEHICLES.) (MATERIALS, ADHESIVES, SEALS, ELASTOMERS, LUBRICANTS, ALLOYS, ALUMINUM ALLOYS, COPPER ALLOYS, MAGNESIUM ALLOYS, MOLYBDENUM ALLOYS, NICKEL ALLOYS, STEEL, STAINLESS STEEL, TITANIUM ALLOYS.) (COMPUTERS, MEMORY DEVICES, DIGITAL COMPUTERS,) *BIBLIOGRAPHY, GYROSCOPES, INSTRUMENTATION.

AD-271 176 62-2-2 DIV. 18
GENERAL DYNAMICS/ASTRONAUTICS, SAN DIEGO, CALIF.
DESCRIPTORS: (*HIGH TEMPERATURE RESEARCH, NIOBIUM ALLOYS, *ALLOYS, *REFRACTORY MATERIALS, REFRACTORY COATINGS.) (*LOW TEMPERATURE RESEARCH, *ADHESIVES, METALS, THERMAL INSULATION, ALLOYS, STAINLESS STEEL, AUSTENITE.) (MECHANICAL PROPERTIES, DEFORMATION, PLASTICITY, NUCLEAR REACTIONS, RADIATION EFFECTS.) (*PLASTICS, *FLUOROCARBONS, CERAMIC MATERIALS.)

*MACH NUMBER 3599132-)

AD-271 376 62-2-2 DIV. 25
APPLIED PHYSICS LAB., JOHNS HOPKINS U., SILVER SPRING, MD.
DESCRIPTORS: (BOUNDARY LAYER, *FLUID FLOW, DRAG, SURFACE PROPERTIES.) (*WAVE CHARACTERISTICS, SUBSONIC FLOW, COMPRESSIBLE FLOW, *MACH NUMBER, SUPERSONIC FLOW.)

*MACHINE TRANSLATION

AD-271 178 62-2-2 DIV. 32
AIR FORCE CAMBRIDGE RESEARCH LABS., BEDFORD, MASS.
DESCRIPTORS: (ANALYSIS OF AUTOMATIC, *LANGUAGE, TRANSLATIONS.) DICTIONARIES, PROGRAMMING, CODING, *MACHINE TRANSLATION, USSR, DATA PROCESSING SYSTEMS.

AD-271 640 62-2-2 DIV. 30
WASHINGTON U., SEATTLE.
DESCRIPTORS: (*MACHINE TRANSLATION, *STATISTICAL ANALYSIS, DIGITAL COMPUTERS, PROGRAMMING.)

*MACHINES

AD-271 402 62-2-2 DIV. 26
MCDONNELL AIRCRAFT CORP., ST. LOUIS, MO.
DESCRIPTORS: (*MACHINES, *MACHINING, ALLOY, ALUMINUM ALLOYS, MAGNESIUM ALLOYS, STEEL, MACHINE TOOLS, PROGRAMMING, CONTROL, COMPUTERS, AUTOMATION.) PRODUCTION, COSTS, DESIGN, MILITARY REQUIREMENTS, SPECIFICATIONS.

*MACHINING

AD-271 402 62-2-2 DIV. 26
MCDONNELL AIRCRAFT CORP., ST. LOUIS, MO.
DESCRIPTORS: (*MACHINES, *MACHINING, ALLOY, ALUMINUM ALLOYS, MAGNESIUM ALLOYS, STEEL, MACHINE TOOLS, PROGRAMMING, CONTROL, COMPUTERS, AUTOMATION.) PRODUCTION, COSTS, DESIGN, MILITARY REQUIREMENTS, SPECIFICATIONS.

AD-271 546 62-2-2 DIV. 26
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (RESISTANCE, HEATING, *MACHINING, HARDNESS, REDUCTION OF STEEL, CAST IRON.) ELECTRICAL EQUIPMENT, INDUSTRIAL PRODUCTION, USSR, ALLOYS, METALS.

*MAGNESIUM ALLOYS

AD-271 106 62-2-2 DIV. 26
LODGE AND SHIPLEY CO., CINCINNATI, OHIO.
DESCRIPTORS: (*AIRFRAMES, *MAGNESIUM ALLOYS, PROCESSING, HYDROFORMING, DESIGN, PRODUCTION, MANUFACTURING METHODS.) (MACHINING OF CONICAL BODIES, CONFIGURATION, TEMPLATES.)

*MAGNESIUM COMPOUNDS

AD-271 385 62-2-2 DIV. 25
CARBORUNDUM CO., NIAGARA FALLS, N. Y.
DESCRIPTORS: (*SINGLE CRYSTALS, *CERAMIC MATERIALS, *MAGNESIUM COMPOUNDS, OXIDES, SILICON COMPOUNDS, CARBIDES, PREPARATION, GROWTH, MECHANICAL PROPERTIES, TESTS.) (FRACTURE (MECHANICS), HIGH TEMPERATURE RESEARCH, STRESSES, DEFORMATION, SHEAR STRESSES, PLASTIC FLOW.) (ULTRASONICS, CUTTING TOOLS, TEST EQUIPMENT.)

*MAGNETIC CORES

AD-270 982 62-2-2 DIV. 7
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.
DESCRIPTORS: (*MAGNETIC CORES, *MAGNETIC MA-

TERIALS; METAL FILMS; STEEL; CERAMIC COATINGS; GLASS; *BINDERS; VISCOSITY; THERMAL EXPANSION;) (METAL FILMS; NICKEL PLATING; ELECTROPLATING PROCESSING;) (CERAMIC COATINGS; GLASS; SILICON COMPOUNDS; SODIUM COMPOUNDS; TITANIUM COMPOUNDS; ZIRCONIUM COMPOUNDS; OXIDES;)

*MAGNETIC DETECTORS

AD-271 456 64-2-4 DIV. 6
DREXEL INST. OF TECH.; PHILADELPHIA, PA.
DESCRIPTORS: (*MAGNETIC DETECTORS; *MINE DETECTORS; THEORY; SIGNAL-TO-NOISE RATIO; *ELECTRIC FILTERS; *DATA PROCESSING SYSTEMS; LINEAR PROGRAMMING; DIGITAL COMPUTERS; MINES; DETECTION; ERRORS;) (NUMERICAL METHODS AND PROCEDURES; INTEGRAL TRANSFORMS; CALCULUS OF VARIATIONS; MATRIX ALGEBRA; SPECIAL FUNCTIONS; PARTIAL DIFFERENTIAL EQUATIONS; INTEGRAL EQUATIONS; TAYLOR'S SERIES; OPERATORS (MATHEMATICS); ALGEBRA; GEOMETRY;)

*MAGNETIC EFFECTS

AD-271 393 64-2-4 DIV. 25
ILLINOIS U.; URBANA.
DESCRIPTORS: (*SILVER COMPOUNDS; *BROMIDES; *CHLORIDES; CRYSTALS; ELECTRONS; MAGNETIC FIELDS; *MAGNETIC EFFECTS; *CONDUCTIVITY; PHOTOELECTRONS; RESISTANCE;) (THEORY; SEMICONDUCTORS; METALS; PHOTOCONDUCTIVITY; HALL EFFECT;) TEST METHODS; TEST EQUIPMENT; *HALIDES.

*MAGNETIC MATERIALS

AD-270 982 64-2-4 DIV. 7
*WESTINGHOUSE ELECTRIC CORP.; PITTSBURGH, PA.
DESCRIPTORS: (*MAGNETIC CORES; *MAGNETIC MATERIALS; METAL FILMS; STEEL; CERAMIC COATINGS; GLASS; *BINDERS; VISCOSITY; THERMAL EXPANSION;) (METAL FILMS; NICKEL PLATING; ELECTROPLATING PROCESSING;) (CERAMIC COATINGS; GLASS; SILICON COMPOUNDS; SODIUM COMPOUNDS; TITANIUM COMPOUNDS; ZIRCONIUM COMPOUNDS; OXIDES;)

*MAGNETOHYDRODYNAMICS

AD-270 922 64-2-4 DIV. 25
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION; *WASHINGTON, D. C.
DESCRIPTORS: (*PLASMA PHYSICS; *PARTICLE ACCELERATORS; DESIGN; GASES; GAS FLOW; IONIZATION; *MAGNETOHYDRODYNAMICS; *SUPERSONIC FLOW;) (VELOCITY MEASUREMENT;) (ARGON; MERCURY VAPORS; ALTERNATING CURRENT; DIRECT CURRENT; PRESSURE; ELECTRIC ARCS; GLOW DISCHARGES; CATHODES;) (HIGH TEMPERATURE RESEARCH; ELECTROMAGNETIC FIELDS; THERMODYNAMICS; MAGNETIC FIELDS;)

AD-271 170 64-2-4 DIV. 25
ARMED SERVICES TECHNICAL INFORMATION AGENCY; ARLINGTON; VA.
DESCRIPTORS: *PLASMA PHYSICS; *MAGNETOHYDRODYNAMICS; *BIBLIOGRAPHY; PLASMA JETS; PLASMA OSCILLATIONS; RE-ENTRY AERODYNAMICS; ATMOSPHERE ENTRY; INSTRUMENTATION; ELECTROMAGNETIC WAVES; SHOCK WAVES; MICROWAVES; GAS IONIZATION; MAGNETIC PINCH; PROPELLANTS; PROPULSION;

AD-271 479 64-2-4 DIV. 25
INSTITUTE FOR FLUID DYNAMICS AND APPLIED MATHEMATICS; U. OF MARYLAND; COLLEGE PARK;
DESCRIPTORS: (*PLASMA PHYSICS; MAGNETIC FIELDS; ICNS; *WAVE TRANSMISSION; *MAGNETOHYDRODYNAMICS; PERTURBATION THEORY;)

*MAGNETOMETERS

AD-271 508 64-2-4 DIV. 30
PHYSICS LAB.; AERONAUTICAL SYSTEMS DIV.; *WRIGHT-PATTERSON AIR FORCE BASE; OHIO.
DESCRIPTORS: (*MAGNETOMETERS; DESIGN; CALIBRATION;) (MAGNETIC FIELDS; THEORY; HALL EFFECT; MATHEMATICAL ANALYSIS;) (INDIUM COMPOUNDS; ARSENIDES; SENSITIVITY TO MAGNETIC FIELDS;) *LABORATORY EQUIPMENT.

*MAGNETOSTRICTIVE ELEMENTS

AD-271 422 64-2-4 DIV. 25
GENERAL ELECTRIC CO.; SYRACUSE, N. Y.
DESCRIPTORS: (*DELAY LINES; MICROWAVE FREQUENCY; *MICROWAVE EQUIPMENT; *SOLID STATE PHYSICS;) (ACOUSTICS; *SOLID DELAY LINES; *MAGNETOSTRICTIVE ELEMENTS; TRANSDUCERS; MAGNETOSTRICTION TRANSDUCERS;) (MICROWAVES; PROPAGATION; SINGLE CRYSTALS; SILICON; GERMANIUM; HYPERSONICS; ATTENUATION;) (PIEZOELECTRIC EFFECT; QUARTZ CRYSTALS; X BAND; WAVEGUIDES;) (BONDING; SEMICONDUCTORS; SILICONES; GREASES; CRYOGENICS; THIN FILMS;)

*MAGNETRONS

AD-271 535 64-2-4 DIV. 8
BOMAC LABS.; INC.; BEVERLY; MASS.
DESCRIPTORS: (*MAGNETRONS; PRODUCTION; *MANUFACTURING METHODS; TEST SETS; DESIGN;) (ELECTRON TUBES; ANODES (ELECTRON TUBES); CATHODES (ELECTRON TUBES); MAGNETIC FIELDS;) (*WAVEGUIDE *INDOR; STANDING WAVE RATIOS; CERAMIC MATERIALS; METALS; GLASS; SAPPHIRES; DESIGN;)

*MAINTENANCE

AD-271 066 64-2-4 DIV. 28
BEHAVIORAL SCIENCES LAB.; AEROSPACE MEDICAL DIV.; *WRIGHT-PATTERSON AIR FORCE BASE; OHIO.
DESCRIPTORS: (*HUMAN ENGINEERING; SPACE FLIGHT;) (*SPACESHIPS; *SATELLITE VEHICLES; *MAINTENANCE; MAINTENANCE PERSONNEL; SENSORY PERCEPTION; *WEIGHTLESSNESS; VISUAL ACUITY; MOTOR REACTIONS; POSITIONING REACTIONS;) (*REMOTE CONTROL SYSTEMS; TEST EQUIPMENT; DESIGN;)

AD-271 477 64-2-4 DIV. 28
NORTHROP CORP.; HAWTHORNE; CALIF.
DESCRIPTORS: (*HUMAN ENGINEERING; *MAINTENANCE; *AIRCRAFT EQUIPMENT; ELECTRICAL EQUIPMENT; DESIGN; INDEXES;) (*ANTHROPOMETRY; TEST EQUIPMENT;) (AUTOMATIC; *TEST EQUIPMENT; MONITORS; TEST SETS;) HANDBOOKS.

*MANAGEMENT ENGINEERING

AD-271 013 64-2-4 DIV. 32
CALIFORNIA U.; BERKELEY.
DESCRIPTORS: (*ECONOMICS; COSTS;) (STATISTICAL ANALYSIS; SPECIAL FUNCTIONS; *MANAGEMENT ENGINEERING;)

*MANEUVERABILITY

AD-271 369 64-2-4 DIV. 31
SPERRY GYROSCOPE CO.; SYOSSET; N. Y.
DESCRIPTORS: (NAVAL VESSELS; *CARGO SHIPS; *MANEUVERABILITY; ACCELERATION; DECELERATION; INERTIAL GUIDANCE; INSTRUMENTATION;) (TESTS; VELOCITY; SHIP HULLS; STABILITY; MATHEMATICAL ANALYSIS;)

*MANUFACTURING METHODS

AD-270 948 64-2-4 DIV. 7
SPRAGUE ELECTRIC CO.; NORTH ADAMS, MASS.
DESCRIPTORS: (*CERAMIC CAPACITORS; *SUBMINIATURE ELECTRICAL EQUIPMENT, MATERIALS; *MANUFACTURING METHODS; PRODUCTION;) (CAPACITORS; CERAMIC MATERIALS; POWDERS, DIELECTRICS; SPRAYS; COATINGS; BINDERS;)

AD-270 975 64-2-4 DIV. 8
RCA INDUSTRIAL TUBE PRODUCTS; LANCASTER; PA.
DESCRIPTORS: (*ELECTRON TUBES; ELECTRODES; *MANUFACTURING METHODS; PRODUCTION; PROCESSING; DESIGN; TESTS; TEST EQUIPMENT; TEST METHODS;)

AD-271 535 64-2-4 DIV. 8
BOMAC LABS.; INC.; BEVERLY; MASS.
DESCRIPTORS: (*MAGNETRONS; PRODUCTION; *MANUFACTURING METHODS; TEST SETS; DESIGN;) (ELECTRON TUBES; ANODES (ELECTRON TUBES); CATHODES (ELECTRON TUBES); MAGNETIC FIELDS;) (*WAVEGUIDE *INDOR; STANDING WAVE RATIOS; CERAMIC MATERIALS; METALS; GLASS; SAPPHIRES; DESIGN;)

AD-271 635 64-2-4 DIV. 26
*AM CHANG CORP.; ALBANY; OREG.
DESCRIPTORS: (*MANUFACTURING METHODS; PROCESSING; REFRACTORY MATERIALS; ALLOYS; *TUNGSTEN ALLOYS; *MOLYBDENUM ALLOYS; SHEETS;) (ROCKET MOTOR NOZZLES; CONICAL NOZZLES; RINGS; PRODUCTION; MACHINING;) CASTING.

*MAPPING

AD-271 438 64-2-4 DIV. 2
GEONAUTICS, INC.; *WASHINGTON, D. C.
DESCRIPTORS: (*GEODESICS; *AERIAL PHOTOGRAPHY; *MAPPING; ROCKETS; PHOTOFLASH PROJECTILES;) (PHOTOGRAPHIC EQUIPMENT; GEODESICS; PHOTOFLASH BULBS;) (TRIGONOMETRY; GEODESICS;)

AD-271 439 64-2-4 DIV. 2
GEONAUTICS, INC.; *WASHINGTON, D. C.
DESCRIPTORS: (GLOBES; ICS; *GEODETIC ASTRONOMY; HIGH ALTITUDE; *PHOTOFLASH BOMBS IN SOUNDING ROCKETS FOR POSITION FINDING; *BRIDGES; RANGE; CONTROL SYSTEMS FOR *MAPPING;) (TRIANOMETRY; *MATRIX ALGEBRA; ERRORS; MATHEMATICAL ANALYSIS;) (GEODETIC DATA; DATA PROCESSING SYSTEMS;)

AD-271 442 64-2-4 DIV. 2
PHOTOGRAMMETRY LAB.; MASS. INST. OF TECH.; CAMBRIDGE.
DESCRIPTORS: (*ATMOSPHERIC REFRACTION; LENSES; DISTORTION; ERRORS; *ANALYSIS OF VARIANCE; GEODESICS; *MAPPING;)

*MARINE PROPELLERS

AD-271 089 64-2-4 DIV. 31
DAVID TAYLOR MODEL BASIN; *WASHINGTON, D. C.
DESCRIPTORS: (*MARINE PROPELLERS; CAVITATION; THRUST;)

*MARTENSITE

AD-270 904 64-2-4 DIV. 17
ILLINOIS U.; URBANA.
DESCRIPTORS: (*IRON ALLOYS; NICKEL ALLOYS; *AUSTENITE; *MARTENSITE; *PHASE TRANSITIONS PHASE STUDIES; MICROSTRUCTURE; CRYSTAL STRUCTURE; LATTICES; TRANSITION TEMPERATURE; X-RAY DIFFRACTION ANALYSIS;) ALLOYS.

*MASERS

AD-271 100 64-2-4 DIV. 25
ARMED SERVICES TECHNICAL INFORMATION AGENCY; ARLINGTON; VA.
DESCRIPTORS: *MASERS; *BIBLIOGRAPHY; *MICROWAVE AMPLIFIERS; *FREQUENCY STABILIZERS; USSR; ELECTRONICS; SCIENTIFIC RESEARCH; *RUBY; *PARAMAGNETIC RESONANCE; CRYOGENICS; PARAMETRIC AMPLIFIERS.

*MASS SPECTROSCOPY

AD-271 055 64-2-4 DIV. 10
MIDWEST RESEARCH INST.; KANSAS CITY; MO.
DESCRIPTORS: (THERMODYNAMICS; *FLAMES WITH GASES; METALS; *MASS SPECTROSCOPY; MASS SPECTOMETERS; SAMPLING;)

*MATERIALS

AD-271 034 64-2-4 DIV. 27
LOCKHEED AIRCRAFT CORP.; SUNNYVALE; CALIF.
DESCRIPTORS: (*BIBLIOGRAPHY; *MATERIALS; METALS; *CONTAINERS; *LIQUID ROCKET PROPELLANTS; LIQUEFIED GASES;) (HYDROGEN; FLUORINE; HYDRAZINES; NITROGEN COMPOUNDS; TETROXIDES;)

AD-271 166 64-2-4 DIV. 1
BOEING CO.; *ICHITA; KANSAS;
DESCRIPTORS: (*AIRFRAMES; *MATERIALS; *METALS; *ALLOYS; TITANIUM ALLOYS; EXTRUSION; *CERAMIC COATINGS; *REFRACTORY COATINGS; FLAME SPRAYING; SEALING COMPOUNDS; ELASTOMERS; *PLASTICS; EXPANDED PLASTICS; *ADHESIVES; RESIN ADHESIVES; SANDWICH CONSTRUCTION; HONEYCOMB CORES; LAMINATES; NOSES;) (MECHANICAL PROPERTIES; TENSILE PROPERTIES; CLIMATIC FACTORS; FAILURE (MECHANICS); HIGH TEMPERATURE RESEARCH;) (POLYMERS; FLUORIDES; FLUOROCARBONS; SILICONES; SILANES; URETHANES; PYRIMIDINES;)

AD-271 167 64-2-4 DIV. 1
BOEING CO.; *ICHITA; KANS.
DESCRIPTORS: (*AIRFRAMES; *RADOMES; *MATERIALS; METALS; ALLOYS; STAINLESS STEEL; CHEMICAL MILLING; PLATING; ALUMINUM; MANGANESE; CADMIUM PLATING; POLYMERS; HEAT RESISTANT POLYMERS; PLASTICS; ADHESIVES; RESIN ADHESIVES; ENAMEL COATINGS; VARNISHES; ORGANIC COATINGS; LAMINATES; TEXTILES; LUBRICANTS;) (METAL JOINTS; TITANIUM;) (BONDING; BRAZING; CERAMIC MATERIALS;) (JET FUELS; IGNITION;) (HIGH TEMPERATURE RESEARCH; MACHINING;)

*MATHEMATICAL LOGIC

AD-271 038 64-2-4 DIV. 15
LOCKHEED AIRCRAFT CORP.; SUNNYVALE; CALIF.
DESCRIPTORS: (*FUNCTIONS; *MATHEMATICAL LOGIC; LATTICES; *LINEAR SYSTEMS; NUMBER THEORY; INEQUALITIES; REAL VARIABLES; COMPLEX VARIABLES; ALGEBRA;)

*MATHEMATICAL PREDICTION

AD-271 148 64-2-4 DIV. 28
EDUCATIONAL TESTING SERVICE; PRINCETON; N. J.
DESCRIPTORS: (*APTITUDE TESTS; *PERSONALITY TESTS; STATISTICAL ANALYSIS; *MATHEMATICAL PREDICTION; COMPUTERS;)

AD-271 367 64-2-4 DIV. 8
SYLVANIA ELECTRIC PRODUCTS, INC.; WALTHAM; MASS.
DESCRIPTORS: (*RELIABILITY; DETERMINATION; *ELECTRONIC SYSTEMS; ELECTRONIC EQUIPMENT;) (STATISTICAL ANALYSIS; NUMERICAL METHODS AND PROCEDURES; *MATHEMATICAL PREDICTION; FAILURE (MECHANICS); TIME, MEASUREMENT;)

*MATRIX ALGEBRA

AD-271 136 64-2-4 DIV. 15
INSTITUTE FOR FLUID DYNAMICS AND APPLIED MATHEMATICS; U. OF MARYLAND; COLLEGE PARK.
DESCRIPTORS: (*INTEGRAL EQUATIONS; *MATRIX ALGEBRA; INEQUALITIES; PARTIAL DIFFERENTIAL EQUATIONS;)

AD-271 439 64-2-4 DIV. 2
GEONAUTICS, INC.; *WASHINGTON, D. C.
DESCRIPTORS: (GLOBES; ICS; *GEODETIC ASTRONOMY; HIGH ALTITUDE; *PHOTOFLASH BOMBS IN SOUNDING ROCKETS FOR POSITION FINDING; *BRIDGES; RANGE; CONTROL SYSTEMS FOR *MAPPING;) (TRIANOMETRY; *MATRIX ALGEBRA; ERRORS; MATHEMATICAL ANALYSIS;) (GEODETIC DATA; DATA PROCESSING SYSTEMS;)

*MECHANICAL PROPERTIES

AD-271 401 64-2-4 DIV. 17
LITTLE, ARTHUR D.; INC.; CAMBRIDGE, MASS.
DESCRIPTORS: (*ALUMINUM; *EXPLOSIVE FORMING;) (TESTS; ELASTICITY; *WAVE TRANSMISSION; PLASTICITY; STRESSES; TENSILE PROPERTIES; *MECHANICAL PROPERTIES;) *METALS; ALLOYS.

*METABOLISM

AD-270 970 64-2-4 DIV. 16
BAYLOR U. COLL. OF MEDICINE; HOUSTON, TEX.
DESCRIPTORS: (*RADIATION EFFECTS; *METABOLISM; *IRON AND *HEMOPOIESIS;) (*CANCER; CELLS (BIOLOGY); BLOOD; BIOCHEMICAL TESTS; ENZYME DETECTION; THERAPY;)

*METAL COATINGS

AD-271 457 64-2-2 DIV. 14
ROCK ISLAND ARSENAL LAB., ILL.
DESCRIPTORS: (STEEL, *CHROMIUM PLATING, *CHROMIUM, ELECTROCHEMISTRY, OXIDATION, ANODES (ELECTROLYTIC CELLS), *COATINGS, *METAL COATINGS, METAL FILMS, CHROMIUM COMPOUNDS, OXIDES, CORROSION INHIBITION, MECHANICAL PROPERTIES, CAMOUFLAGE.) (MANUFACTURING METHODS, SOLUTIONS, CHROMIC ACID, SODIUM COMPOUNDS, HYDROXIDES, SULFITES.)

*METAL FILMS

AD-270 926 64-2-2 DIV. 27
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*CYLINDRICAL BODIES, COATING, *METAL FILM, *IONS, ELECTROSTATICS, ANALYSIS, *ELECTRIC PROPULSION, ROCKET MOTORS.) (CESIUM, VAPORS, IONIZATION) (PLATINUM, TANTLUM, WIRE, HEATING, DENSITY, SPACE CHARGES.) (DIFFERENTIAL EQUATIONS, INTEGRAL EQUATIONS.) ION SOURCES.

AD-271 645 64-2-2 DIV. 8
ARMOUR RESEARCH FOUNDATION, CHICAGO, ILL.
DESCRIPTORS: (SEMICONDUCTORS, *THIN FILMS, *SEMICONDUCTING FILMS, *DIELECTRIC FILMS, *METAL FILMS, MANUFACTURING METHODS, CONDUCTIVITY, HALL EFFECT, DIELECTRIC PROPERTIES, ELECTRICAL PROPERTIES, CRYSTAL STRUCTURE, X-RAY DIFFRACTION ANALYSIS.) (METALLIC SMOKE DEPOSITS, SURFACES, METALS, LIQUID METALS.) (SILICON COMPOUNDS, TITANIUM COMPOUNDS, DIOXIDES, CARBIDES, BORIDES, BORON, BORON COMPOUNDS, PHOSPHIDES, MERCURY COMPOUNDS, SELENIDES, TELLURIDES, TITANIUM ALLOYS, COPPER ALLOYS, BONDING, ANTIOXIDANTS.)

*METAL PLATES

AD-271 412 64-2-2 DIV. 17
TITANIUM METALS CORP. OF AMERICA, TORONTO, OHIO.
DESCRIPTORS: (*METAL PLATES, *TITANIUM ALLOYS, VANADIUM ALLOYS, CHROMIUM ALLOYS, ALUMINUM ALLOYS, WELDING, ARC WELDING, GASES, ARGON, HELIUM.) (WELDING RODS, WELDED JOINTS, WELDS, MECHANICAL PROPERTIES, TENSILE PROPERTIES, DEFORMATION, IMPACT SHOCK, CREEP, HARDNESS, MICROSTRUCTURE, FRACTURE (MECHANICS),) CHEMICAL ANALYSIS, MICROPHOTOGRAPHY, MANUFACTURING METHODS, PRODUCTION.

*METAL SEALS

AD-271 429 64-2-2 DIV. 17
NARMCO INDUSTRIES, INC., SAN DIEGO, CALIF.
DESCRIPTORS: (*STAINLESS STEEL, SHEETS, *SANDWICH PANELS, *HONEYCOMB CORES, BONDING, BONDED JOINTS, METAL JOINTS, BRAZING.) (*ADHESIVES, *METAL SEALS, SEALS, MATERIALS, CERAMIC MATERIALS, GLASS, COPPER ALLOYS, SILVER ALLOYS.) (HIGH TEMPERATURE RESEARCH, HIGH PRESSURE RESEARCH, PROCESSING, MECHANICAL PROPERTIES, TENSILE PROPERTIES.)

*METALLIC TEXTILES

AD-271 473 64-2-2 DIV. 17
GOODYEAR AIRCRAFT CORP., AKRON, OHIO.
DESCRIPTORS: (*METALLIC TEXTILES, THREADS, STAINLESS STEEL, NICKEL ALLOYS, CHROMIUM ALLOYS, COBALT ALLOYS, MANUFACTURING METHODS, PRODUCTION, *INDUSTRIAL EQUIPMENT, DESIGN.) (RE-ENTRY VEHICLES, STRUCTURES.)

*METALLURGY

AD-270 900 64-2-2 DIV. 17
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: (ALLOYS, ALUMINUM ALLOYS, HAFNIUM ALLOYS, HEAT RESISTANT ALLOYS, METAL PLATES, METALS, MOLYBDENUM ALLOYS, NIOBIUM ALLOYS, POWDER ALLOYS, REFRACTORY MATERIALS RHENIUM ALLOYS, SHEETS, STAINLESS STEEL, STEEL, TANTALUM ALLOYS, TITANIUM ALLOYS, TUNGSTEN ALLOYS.) (VANADIUM ALLOYS, ZIRCONIUM ALLOYS.) (MANUFACTURING METHODS, METAL FORMING PRESSES, WELDING, EXTRUSION.) (EXPLOSIVES, SHOCK WAVES, ENERGY, TRANSMISSION WATER, OILS.) (AIRFRAMES, CYLINDRICAL BODIES, SPHERES, STRUCTURAL SHELLS, HEMISPHERICAL SHELLS.) *EXPLOSIVE FORMING, *BIBLIOGRAPHY, *METALLURGY, HARDENING, USSR, GREAT BRITAIN,

*METALORGANIC COMPOUNDS

AD-271 451 64-2-2 DIV. 4
INORGANIC RESEARCH LAB., WESTERN RESERVE U., CLEVELAND, OHIO.
DESCRIPTORS: (*METALORGANIC COMPOUNDS, ESTERS, PHENYL RADICALS, *SILICONES, THIO RADICALS, *VANADATES, VANADIUM COMPOUNDS, SYNTHESIS, CHEMICAL ANALYSIS,)

*METALS

AD-271 009 64-2-2 DIV. 25
SYRACUSE U., N. Y.
DESCRIPTORS: (*FRACTURE (MECHANICS), *METALS, *ALLOYS, *TITANIUM ALLOYS, ALUMINUM ALLOYS, VANADIUM ALLOYS, STRESSES, DEFORMATION, PROPAGATION, GRAINS (METALLURGY), METALLURGICAL ANALYSIS, THEORY,)

AD-271 108 64-2-2 DIV. 30
MIDWEST RESEARCH INST., KANSAS CITY, MO.
DESCRIPTORS: (*ULTRASONICS, *NON-DESTRUCTIVE TESTING, *METALS, *STRESSES, THERMAL STRESSES, PLASTIC FLOW, DEFORMATION, LATTICES, COMPRESSION SHOCK, VELOCITY, ATTENUATION, MEASUREMENT, ELASTICITY, ALUMINUM, STEEL,) TEST EQUIPMENT, STRAIN GAGES, TRANSDUCERS, PULSE GENERATORS, OSCILLOSCOPES.

AD-271 143 64-2-2 DIV. 17
WATERTOWN ARSENAL LABS., MASS.
DESCRIPTORS: (METALS, *NON-DESTRUCTIVE TESTING, *ULTRASONICS, ATTENUATION, FREQUENCY, EFFECTIVENESS, TEST METHODS,) (ALUMINUM, GRAINS (METALLURGY), MICROSTRUCTURE,)

AD-271 151 64-2-2 DIV. 25
MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*METALS, *CANTILEVER BEAMS, *FATIGUE (MECHANICS), *VIBRATION, *SHEAR STRESSES, LOADING, DEFORMATION, *LOAD DISTRIBUTION,) (TIME, MATERIALS, FREQUENCY, DAMPING, OSCILLATION,) (PROBABILITY, STATISTICAL DISTRIBUTIONS, STATISTICAL FUNCTIONS, HARMONIC ANALYSIS, STATISTICAL PROCESSES, GEOMETRY, INTEGRATION, DIFFERENTIAL EQUATIONS, INTEGRAL EQUATIONS, NUMERICAL ANALYSIS, SEQUENCES,)

AD-271 166 64-2-2 DIV. 1
BOEING CO., WICHITA, KANSAS.
DESCRIPTORS: (*AIRFRAMES, *MATERIALS, *METALS, *ALLOYS, TITANIUM ALLOYS, EXTRUSION, *CERAMIC COATINGS, *REFRACTORY COATINGS, FLAME SPRAYING, SEALING COMPOUNDS, ELASTOMERS, *PLASTICS, EXPANDED PLASTICS, *ADHESIVES, RESIN ADHESIVES, SANDWICH CONSTRUCTION, HONEYCOMB CORES, LAMINATES, HOSES,) (MECHANICAL PROPERTIES, TENSILE PROPERTIES, CLIMATIC FACTORS, FAILURE (MECHANICS), HIGH TEMPERATURE RESEARCH,) (POLYMERS, FLUORIDES, FLUOROCARBONS, SILICONES, SILANES, URETHANES, PYRIMIDINES,)

AD-271 401 64-2-2 DIV. 17
LITTLE, ARTHUR D., INC., CAMBRIDGE, MASS.
DESCRIPTORS: (*ALUMINUM, *EXPLOSIVE FORMING,) (TESTS, ELASTICITY, *AVE TRANSMISSION, PLASTICITY, STRESSES, TENSILE PROPERTIES, *MECHANICAL PROPERTIES,) *METALS, ALLOYS,

AD-271 470 64-2-2 DIV. 25
UTAH U., SALT LAKE CITY.
DESCRIPTORS: (*PARTICLES, *PELLETS, *HYPERSONICS, VELOCITY, *IMPACT SHOCK, METEOROLOGY, PARTICLE ACCELERATORS, *METALS,) (SATELLIT VEHICLES, EROSION,) (PELLETS, ACCELERATION,) (PARTICLES, HYDROGEN, ATOMS, SCATTERING, COPPER, ARGON,) FEASIBILITY STUDIES, SPECTROGRAPHIC ANALYSIS.

AD-271 536 64-2-2 DIV. 26
DOUGLAS AIRCRAFT CO., INC., LONG BEACH, CALIF.
DESCRIPTORS: (*ALLOYS, AND *METALS FOR AIRCRAFT, MATERIALS AND STRUCTURES, PRODUCTION BY *CHEMICAL MILLING, GELS, CARBOXYMETHYLCELLULOSE, POROUS MATERIALS, SOLIDS, SOLUTIONS CHEMICALS,) (PROCESSING, STEEL, STAINLESS STEEL, NICKEL ALLOYS, TITANIUM ALLOYS, VANADIUM ALLOYS, CHROMIUM ALLOYS, ALUMINUM ALLOYS, *REFRACTORY MATERIALS, HEAT RESISTANT ALLOYS, MOLYBDENUM ALLOYS, TITANIUM ALLOYS, TANTALUM, NIOBIUM,)

AD-271 593 64-2-2 DIV. 16
AEROSPACE MEDICAL DIV., *RIGHT AIR DEVELOPMENT DIV., *RIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: (*BRAIN, *TISSUES (BIOLOGY), *METALS, *TRANSPLANTATION, HISTOLOGICAN

*METEORITES

AD-271 540 64-2-2 DIV. 2
AEROSPACE INFORMATION DIV., *WASHINGTON, D. C.
DESCRIPTORS: (*METEORITES, OPTICS, ATMOSPHERE, OPTICAL ANALYSIS, SIBERIA,)

*MICROWAVE AMPLIFIERS

AD-271 100 64-2-2 DIV. 25
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: *MASERS, *BIBLIOGRAPHY, *MICROWAVE AMPLIFIERS, *FREQUENCY STABILIZERS, USSR, ELECTRONICS, SCIENTIFIC RESEARCH, *RUBY, *PARAMAGNETIC RESONANCE, CRYOGENICS, PARAMETRIC AMPLIFIERS.

AD-271 399 64-2-2 DIV. 8
LITTON INDUSTRIES, SAN CARLOS, CALIF.
DESCRIPTORS: (*MICROWAVE AMPLIFIERS, X-BAND, *ELECTRON BEAMS, *ELECTRON TUBES, *ELECTRON GUNS, DESIGN, RADIOFREQUENCY POWER, COMPUTERS, MANUFACTURING METHODS, PRODUCTION,) (WAVEGLIDE COUPLERS, STANDING WAVE RATIOS, IMPEDANCE MATCHING,)

AD-271 482 64-2-2 DIV. 8
MICROWAVE LAB., GENERAL ELECTRIC CO., PALO ALO, CALIF.
DESCRIPTORS: (*TRAVELING WAVE TUBES, X BAND, *MICROWAVE AMPLIFIERS, BROADBAND,) (AMPLIFIERS, ELECTRON TUBES, ELECTRON GUNS, HELIXES, ELECTRONIC CIRCUITS, FOCUSING, MATERIALS, METALS, CERAMIC MATERIALS,)

*MICROWAVE EQUIPMENT

AD-271 422 64-2-2 DIV. 25
GENERAL ELECTRIC CO., SYRACUSE, N. Y.
DESCRIPTORS: (*DELAY LINES, MICROWAVE FREQUENCY, *MICROWAVE EQUIPMENT, *SOLID STATE PHYSICS,) (ACOUSTICS, *SOLID DELAY LINES, *MAGNETOSTRICTIVE ELEMENTS, TRANSDUCERS, MAGNETOSTRICTION TRANSDUCERS,) (MICROWAVES, PROPAGATION, SINGLE CRYSTALS, SILICON, GERMANIUM, HYPERSONICS, ATTENUATION,) (PIEZOELECTRIC EFFECT, QUARTZ CRYSTALS, X BAND, WAVEGUIDES,) (BONDING, SEMICONDUCTORS, SILICONES, GREASES, CRYOGENICS, THIN FILMS,)

*MICROWAVE OSCILLATORS

AD-271 587 64-2-2 DIV. 25
NAVAL ORDNANCE LAB., CORONA, CALIF.
DESCRIPTORS: (*TELEPHONE COMMUNICATION SYSTEMS, PANEL BOARDS (ELECTRICITY), NOISE GENERATORS, THEORY, DESIGN,) (*FERROMAGNETISM, *IRON ALLOYS, *NICKEL ALLOYS, FILMS,) (*RARE GASES, INFRARED SPECTROSCOPY, INTERFEROPETERS, ELECTROMAGNETIC WAVES, WAVE TRANSMISSION,) (*SEMICONDUCTORS, *SILICON, MAGNETO-OPTIC ROTATION,) (*HEAT RESISTANT POLYMERS, *POLYMERS, *PHOSPHINES, PHENYL RADICALS, CHLORIDES, SYNTHESIS, CHEMICAL REACTIONS,) (SOLID STATE PHYSICS, *MICROWAVE OSCILLATORS, *DIODES, *RARE EARTH COMPOUNDS, CALCIUM COMPOUNDS, FLUORIDES, *THULIUM COMPOUNDS, SPECTROPHOTOMETERS, ABSORPTION, FLUORESCENCE, CRYSTALS,) (*GUIDED MISSILE ANTENNAS, *SLOT ANTENNAS, *WAVEGUIDE SLOTS, DIELECTRICS, ANTENNA RADIATION PATTERNS, MEASUREMENT,)

*MICROWAVE SPECTROSCOPY

AD-271 029 64-2-2 DIV. 25
COLORADO U., BOULDER.
DESCRIPTORS: (*TABLES, *MICROWAVE SPECTROSCOPY, ROTATION, RESONANCE, FREQUENCY, CONTROL, MICROWAVES,) (ALGEBRA, THEORY, INTEGRAL EQUATIONS, MATRIX ALGEBRA, DIPOLE MOMENTS, *QUANTUM MECHANICS,)

*MICROWAVES

AD-270 999 64-2-2 DIV. 25
RAYTHEON CO., WALTHAM, MASS.
DESCRIPTORS: (*STRONTIUM COMPOUNDS, TITANATES, TEMPERATURE, *MICROWAVES, ABSORPTION, ATTENUATION,) *FERROELECTRIC MATERIALS.

AD-271 615 64-2-2 DIV. 8
GOETTINGEN U. (GERMANY),
DESCRIPTORS: (ELECTROMAGNETIC WAVES, *ELECTROMAGNETIC WAVE REFLECTIONS, *MICROWAVES, REFLECTION, EXTREMELY HIGH FREQUENCY, ABSORPTION, MATERIALS,) (MICROWAVES, *RESONANCE ABSORPTION, DIPOLE ANTENNAS,) PROPAGATION.

*MILITARY COMMUNICATIONS

AD-271 549 64-2-2 DIV. 5
LABORATORIES FOR RESEARCH AND DEVELOPMENT, FRANKLIN INST., PHILADELPHIA, PA.
DESCRIPTORS: (*COMMUNICATION SYSTEMS, *MILITARY COMMUNICATIONS, *OPERATIONS RESEARCH, COLLECTING METHODS, DATA, MILITARY ORGANIZATIONS, INFORMATION THEORY,) (HUMAN ENGINEERING, ERRORS, RELIABILITY,)

*MILITARY GOVERNMENT

AD-271 444 64-2-2 DIV. 18
OPERATIONS RESEARCH OFFICE, JOHNS HOPKINS U., BETHESDA, MD.
DESCRIPTORS: (*OPERATIONS RESEARCH, *CIVILAN DEFENSE SYSTEMS, FOREIGN POLICY, *MILITARY GOVERNMENT,)

*MILITARY OPERATIONS

AD-270 960 64-2-2 DIV. 18
OPERATIONS ANALYSIS OFFICE, AIR FORCE, WASHINGTON, D. C.
DESCRIPTORS: (*OPERATIONS RESEARCH, *MILITRY OPERATIONS, CIVILIAN DEFENSE SYSTEMS, WARFAE, CONTROL,)

AD-271 017 64-2-2 DIV. 28
HUMAN RESOURCES RESEARCH OFFICE, GEORGE WASHINGTON U., WASHINGTON, D. C.
DESCRIPTORS: (*BIBLIOGRAPHY, HUMAN ENGINEERING,) (MILITARY RESEARCH, REPORTS,) (*MILITARY OPERATIONS, TRAINING, MILITARY TRAINING,)

*MILITARY PSYCHOLOGY

AD-271 149 64-2-2 DIV. 28
EDUCATIONAL TESTING SERVICE, PRINCETON, N. J.
DESCRIPTORS: (*INDUSTRIAL PSYCHOLOGY, *MILITARY PSYCHOLOGY, *RECRUITING, MILITARY PERSONNEL, PSYCHOMETRICS, MATHEMATICAL ANALYSIS, COMBINATORIAL ANALYSIS, EFFECTIVENESS,)

*MILITARY RATIONS

AD-271 381 64-2-2 DIV. 29
NAVAL SUPPLY RESEARCH AND DEVELOPMENT FACILITY, BAYONNE, N. J.
DESCRIPTORS: (*DEHYDRATED SUBSTANCES, *MILITARY RATIONS, *POTATOES, COSTS, STORAGE,)

*MILITARY RESEARCH

AD-271 017 62-2-2 DIV. 28
HUMAN RESOURCES RESEARCH OFFICE, GEORGE WASHINGTON U., WASHINGTON, D. C.
DESCRIPTORS: (*BIBLIOGRAPHY, HUMAN ENGINEERING.) (MILITARY RESEARCH, REPORTS.) (*MILITARY OPERATIONS, TRAINING, MILITARY TRAINING.)

*MILITARY TRAINING

AD-271 150 62-2-2 DIV. 23
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: *TEACHING MACHINES, *BIBLIOGRAPHY, *TRAINING DEVICES, *LEARNING, *EDUCATION, *MILITARY TRAINING.

AD-271 483 62-2-2 DIV. 23
PSYCHOLOGICAL RESEARCH ASSOCIATES, INC., ARLINGTON, VA.
DESCRIPTORS: (*TRAINING, *MILITARY TRAINING, *SELECTION OF TRAINING DEVICES, EFFECTIVENESS.) (*JOB ANALYSIS, AVIATION PERSONNEL.)

*MINE DETECTORS

AD-271 458 62-2-2 DIV. 6
DREXEL INST. OF TECH., PHILADELPHIA, PA.
DESCRIPTORS: (*MAGNETIC DETECTORS, *MINE DETECTORS, THEORY, SIGNAL-TO-NOISE RATIO, ELECTRIC FILTERS, *DATA PROCESSING SYSTEMS, LINEAR PROGRAMMING, DIGITAL COMPUTERS, MINES, DETECTION, ERRORS,) (NUMERICAL METHODS AND PROCEDURES, INTEGRAL TRANSFORMS, CALCULUS OF VARIATIONS, MATRIX ALGEBRA, SPECIAL FUNCTIONS, PARTIAL DIFFERENTIAL EQUATIONS, INTEGRAL EQUATIONS, TAYLOR'S SERIES, OPERATORS (MATHEMATICS), ALGEBRA, GEOMETRY.)

*MOLECULAR ROTATION

AD-271 121 62-2-2 DIV. 4
PRINCETON U., N. J.
DESCRIPTORS: (*ORGANIC COMPOUNDS, LIQUIDS, SOLIDS, *MOLECULAR STRUCTURE, *MOLECULAR ROTATION, RELAXATION TIME, MOLECULAR SPECTROSCOPY, *DIELECTRICS, *DIELECTRIC PROPERTIES, DIPOLE MOMENTS, VICOSITY, MECHANICAL PROPERTIES.) (ETHERS, AMINES, ALKOXY RADICALS, BENZENES, ALKYL RADICALS, HALIDES, QUINOLINES, QUINONES.) MICROWAVE SPECTROSCOPY.

*MOLECULAR STRUCTURE

AD-271 121 62-2-2 DIV. 4
PRINCETON U., N. J.
DESCRIPTORS: (*ORGANIC COMPOUNDS, LIQUIDS, SOLIDS, *MOLECULAR STRUCTURE, *MOLECULAR ROTATION, RELAXATION TIME, MOLECULAR SPECTROSCOPY, *DIELECTRICS, *DIELECTRIC PROPERTIES, DIPOLE MOMENTS, VICOSITY, MECHANICAL PROPERTIES.) (ETHERS, AMINES, ALKOXY RADICALS, BENZENES, ALKYL RADICALS, HALIDES, QUINOLINES, QUINONES.) MICROWAVE SPECTROSCOPY.

*MOLYBDENUM ALLOYS

AD-271 503 62-2-2 DIV. 17
ARMCUR RESEARCH FOUNDATION, CHICAGO, ILL.
DESCRIPTORS: (*STEEL, *NICKEL ALLOYS, *MOLYBDENUM ALLOYS, *TUNGSTEN ALLOYS.) (PROCESSING, HEAT TREATMENT, MELTING, INDUCTION HEATING, DEOXIDATION, SILICON, ALUMINUM, CARBON.) TESTS, MECHANICAL PROPERTIES, FATIGUE (MECHANICS), TENSILE PRUPERTIES, ALLOYS.

AD-271 551 62-2-2 DIV. 26
HAMILTON STANDARD DIV., UNITED AIRCRAFT CORP., WINDSOR LOCKS, CONN.
DESCRIPTORS: (*TUNGSTEN, *MOLYBDENUM ALLOYS, SHEETS, *ELECTRIC WELDING, WELDING, ELECTRON BEAMS,) (WELDS, WELDED JOINTS, RADIOGRAPHIC ANALYSIS, METALLURGICAL ANALYSIS, MECHANICAL PROPERTIES, TENSILE PROPERTIES, SURFACE PROPERTIES, DEFORMATION, FRACTURE (MECHANICS), POROSITY, GRAINS (METALLURGY), MELTING, CRYSTALLIZATION,) (MACHINING, ELECTROEMOSIVE MACHINING, PROCESSING,) METALS, ALLOYS.

AD-271 635 62-2-2 DIV. 26
WAH CHANG CORP., ALBANY, OREG.
DESCRIPTORS: (*MANUFACTURING METHODS, PROCESSING, REFRACTORY MATERIALS, ALLOYS, *TUNGSTEN ALLOYS, *MOLYBDENUM ALLOYS, SHEETS,) (ROCKET MOTOR NOZZLES, CONICAL NOZZLES, RINGS, PRODUCTION, MACHINING,) CASTING.

*MOLYBDENUM COMPOUNDS

AD-271 580 62-2-2 DIV. 17
MANUFACTURING LABS., INC., CAMBRIDGE, MASS.
DESCRIPTORS: (HIGH PRESSURE RESEARCH, HIGH TEMPERATURE RESEARCH, METALLURGY, *PHASE STUDIES,) (HYDROSTATIC PRESSURE, PHASE TRANSITIONS, *IRON ALLOYS, CHROMIUM ALLOYS, NICKEL ALLOYS, SILICON ALLOYS,) (IRON ALLOYS, *CARBON ALLOYS, AUSTENITE,) (*MOLYBDENUM COMPOUNDS, *CARBIDES, SYNTHESIS,) (COPPER, *BRASS, MICROSTRUCTURE, STRESSES, REACTION KINETICS, RELAXATION TIME,) (*ALUMINUM COMPOUNDS, OXIDES, SINTERING,) (CERIUM, HALL EFFECT, MEASUREMENT,) BRITTLE MATERIALS, ALLOYS, METALS, TEST EQUIPMENT, X-RAY DIFFRACTION ANALYSIS.

*MOMENTS

AD-270 966 62-2-2 DIV. 9
PRINCETON U., N. J.
DESCRIPTORS: (EXPERIMENTAL DATA, *RINGS, AERODYNAMIC CONFIGURATIONS, *AERODYNAMICS, *MOMENTS, WIND TUNNELS, SUBSONIC FLOW, VARIABLE PITCH PROPELLERS,) (*SHORT TAKE-OFF PLANES, AERODYNAMICS,) (LIFT, DRAG,)

*MOON

AD-271 033 62-2-2 DIV. 12
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*BIBLIOGRAPHY, *MOON, GEOLOGY, SPACESHIPS, LUNAR PROBES, MANNED, GUIDED MISSILE TRAJECTORIES, ROCKET TRAJECTORIES, SATELLITE VEHICLE TRAJECTORIES, LANDING,)

*MOTION

AD-271 146 62-2-2 DIV. 12
ILLINOIS U., URBANA.
DESCRIPTORS: (SPIN, *MOTION, ROTATION, EQUATIONS,) (GUIDED MISSILE TRAJECTORIES, *ROCKET MOTORS, FUEL CELLS,) (DYNAMICS, BALLISTICS, GUIDED MISSILES,) *STABILIZATION SYSTEMS.

AD-271 450 62-2-2 DIV. 12
SPACE TECHNOLOGY LABS., INC., LOS ANGELES, CALIF.
DESCRIPTORS: (*STABILITY OF *MOTION,) (CURVE FITTING, SPHERES, SATELLITE VEHICLE TRAJECTORIES,) (PERTURBATION THEORY, DIFFERENTIA EQUATIONS,) USSR.

*NICKEL

AD-271 478 62-2-2 DIV. 17
RESEARCH INST., U. OF MICHIGAN, ANN ARBOR.
DESCRIPTORS: (*NICKEL, *NIOBIUM, *CREEP, DEFORMATION, LATTICES, HARDENING, *CRYSTAL STRUCTURE, HEAT TREATMENT, ROLLING MILLS,) (TEST METHODS, PREPARATION, ELECTROLYTIC POLISHING, PHASE TRANSITIONS, HEAT OF FUSION, MELTING, ELECTRON GUNS, GRAINS (METALLURGY), RUPTURE, MICROSTRUCTURE, X-RAY DIFFRACTION ANALYSIS,) METALS.

*NICKEL ALLOYS

AD-271 174 62-2-2 DIV. 27
DEFENSE METALS INFORMATION CENTER, COLUMBUS, OHIO.
DESCRIPTORS: (*HEAT RESISTANT ALLOYS, *NICKEL ALLOYS FOR PRODUCTION OF *GAS TURBINES, ROTATING STRUCTURES, TURBINE BLADES, TURBINE WHEELS, GAS TURBINE ROTORS IN AUXILIARY POWER PLANTS, CENTRIFUGAL PUMPS, FUEL PUMPS OF ROCKET MOTORS, GROUND SUPPORT EQUIPMENT, GAS GENERATING SYSTEMS, RELIABILITY, EFFECTIVENESS, BOOSTER ROCKETS.

AD-271 427 62-2-2 DIV. 26
NARMCO INDUSTRIES, INC., SAN DIEGO, CALIF.
DESCRIPTORS: (*STAINLESS STEEL, *NICKEL ALLOYS, CHROMIUM ALLOYS, COBALT ALLOYS, *BRAZING, MATERIALS, CERAMIC MATERIALS, ADHESIVES, CHEMICAL REACTIONS, MANGANESE ALLOYS, NICKEL ALLOYS, BONDING, PROCESSING,)

AD-271 480 62-2-2 DIV. 17
MICHIGAN U., ANN ARBOR
DESCRIPTORS: (*NICKEL ALLOYS, *COBALT ALLOYS, CHROMIUM ALLOYS, MOLYBDENUM ALLOYS, TITANIUM ALLOYS, ALUMINUM ALLOYS, *CREEP ON MECHANICL PROPERTIES AND MICROSTRUCTURE,) (TEST EQUIPMENT, HEATING, STRAIN GAGES, EXTENSOMETERS, DEFORMATION, LOAD DISTRIBUTION, IMPACT SHOCK, MICROSCOPY, ELECTRON MICROSCOPY, X-RAY DIFFRACTION ANALYSIS,) (HIGH TEMPERATURE RESEARCH, THERMAL STRESSES, TIME, GRAINS (METALLURGY), CRYSTAL STRUCTURE, PHASE TRANSITIONS, CARBIDES, TEMPERATURE, PLASTIC FLOW, HARDENING, RUPTURE,) ALLOYS.

AD-271 503 62-2-2 DIV. 17
ARMCUR RESEARCH FOUNDATION, CHICAGO, ILL.
DESCRIPTORS: (*STEEL, *NICKEL ALLOYS, *MOLYBDENUM ALLOYS, *TUNGSTEN ALLOYS,) (PROCESSING, HEAT TREATMENT, MELTING, INDUCTION HEATING, DEOXIDATION, SILICON, ALUMINUM, CARBON,) TESTS, MECHANICAL PROPERTIES, FATIGUE (MECHANICS), TENSILE PROPERTIES, ALLOYS.

AD-271 571 62-2-2 DIV. 17
MICHIGAN U., ANN ARBOR.
DESCRIPTORS: (*HEAT RESISTANT ALLOYS, ALLOYS, *NICKEL ALLOYS, *COBALT ALLOYS, *CHROMIUM ALLOYS, MOLYBDENUM ALLOYS, *CREEP EFFECTS MECHANICAL PROPERTIE, MICROSTRUCTURE, PHASE STUDIES,) (HIGH TEMPERATURE RESEARCH, TEST, HARDNESS, TENSILE PROPERTIES, IMPACT SHOCK, RUPTURE, DEFORMATION, SURFACE PROPERTIES, HEAT TREATMENT,) (X-RAY DIFFRACTION ANALYSIS, ELECTRON DIFFRACTION ANALYSIS, ELECTRON MICROSCOPY, MICROSCOPY, EXTENSOMETERS, DILATOMETERS, THERMOCOUPLES,)

AD-271 587 62-2-2 DIV. 25
NAVAL ORDNANCE LAB., CORONA, CALIF.
DESCRIPTORS: (*TELEPHONE COMMUNICATION SYSTEMS, PANEL BOARDS (ELECTRICITY), NOISE GENERATORS, THEORY, DESIGN,) (*FERROMAGNETSM, *IRON ALLOYS, *NICKEL ALLOYS, FILMS,) (*RARE GASES, INFRARED SPECTROSCOPY, INTERFEROPETERS, ELECTROMAGNETIC WAVES, WAVE TRANSMISSION,)

(*SEMICONDUCTORS, *SILICON, MAGNETO-OPTIC ROTATION,) (*HEAT RESISTANT POLYMERS, *POLYMERS, *PHOSPHINES, PHENYL RADICALS, CHLORIDES, SYNTHESIS, CHEMICAL REACTIONS,) (SOLID STATE PHYSICS, *MICROWAVE OSCILLATORS, *DIODES, *RARE EARTH COMPOUNDS, CALCIUM COMPOUNDS, FLUORIDES, *THULIUM COMPOUNDS, SPECTROPHOTOMETERS, ABSORPTION, FLUORESCENCE, CRYSTALS,) (*GUIDED MISSILE ANTENNAS, *SLOT ANTENNAS, *WAVEGUIDE SLOTS, DIELECTRICS, ANTENNA RADIATION PATTERNS, MEASUREMENT,)

*NIGHT SKY

AD-271 137 62-2-2 DIV. 30
AEROPHYSICS LAB., MASS. INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*NIGHT SKY, LUMINESCENCE, INFRARED RADIATION, MEASUREMENT BY *PHOTOMETERS IN AIRCRAFT SEARCHLIGHTS,) (PHOTOMULTIPLIERS, COOLING,) ROTARY SHUTTERS, LIGHT COMMUNICATION SYSTEMS.

*NIOBIUM

AD-271 478 62-2-2 DIV. 17
RESEARCH INST., U. OF MICHIGAN, ANN ARBOR.
DESCRIPTORS: (*NICKEL, *NIOBIUM, *CREEP, DEFORMATION, LATTICES, HARDENING, *CRYSTAL STRUCTURE, HEAT TREATMENT, ROLLING MILLS,) (TEST METHODS, PREPARATION, ELECTROLYTIC POLISHING, PHASE TRANSITIONS, HEAT OF FUSION, MELTING, ELECTRON GUNS, GRAINS (METALLURGY), RUPTURE, MICROSTRUCTURE, X-RAY DIFFRACTION ANALYSIS,) METALS.

*NITROGEN COMPOUNDS

AD-271 173 62-2-2 DIV. 4
FLORIDA U. ENGINEERING AND INDUSTRIAL EXPERIMENT STATION, GAINSVILLE.
DESCRIPTORS: (*FLUOROCARBONS, *NITROGEN COMPOUNDS, *FLUORIDES, CHEMICAL REACTIONS,) (FREE RADICALS, FLUORIDES, AZIDES, DISSOCIATION, HYDRAZINES, PYHOLYSIS, ULTRAVIOLET RADIATION, DECOMPOSITION, CHEMICAL BONDS, STABILITY, CARBONYL RADICALS, IMIDES, FLUORINATION,) (INFRARED SPECTROSCOPY, CHROMATOGRAPHIC ANALYSIS,)

*NITROGLYCERIN

AD-271 597 62-2-2 DIV. 10
ARMCUR RESEARCH FOUNDATION, CHICAGO, ILL.
DESCRIPTORS: (*LIQUID ROCKET PROPELLANTS, *NITROGLYCERINE, SENSITIVITY, DETONATION, TESTS,) (TEST METHODS, VAPOR PRESSURE, SURFACE TENSION, HEATING, HEAT TRANSFER, *PHOTOLYSIS, XENON LAMPS, INFRARED RADIATION, ULTRAVIOLET RADIATION, *PHOTOCHEMICAL REACTIONS,) (ABSORPTION, *ATER,) (TIME, TEMPERATURE, PRESSURE, SHOCK TUBES,)

*NOMOGRAPHS

AD-271 093 62-2-2 DIV. 31
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*NOMOGRAPHS, *VISIBILITY, *SWIMMING, MEASUREMENT,) (INSTRUMENTATION, *WATER, VISION, MATHEMATICAL ANALYSIS,) (*VISUAL PERCEPTION, SPACE PERCEPTION,)

*NON-DESTRUCTIVE TESTING

AD-271 108 62-2-2 DIV. 30
MIDWEST RESEARCH INST., KANSAS CITY, MO.
DESCRIPTORS: (*ULTRASONICS, *NON-DESTRUCTIVE TESTING, *METALS, *STRESSES, THERMAL STRESSES, PLASTIC FLOW, DEFORMATION, LATTICES, COMPRESSION SHOCK, VELOCITY, ATTENUATION, MEASUREMENT, ELASTICITY, ALUMINUM, STEEL,) TEST EQUIPMENT, STRAIN GAGES, TRANSDUCERS, PULSE GENERATORS, OSCILLOSCOPES.

AD-271 143 62-2-2 DIV. 17
WATERTOWN ARSENAL LABS., MASS.
DESCRIPTORS: (METALS, *NON-DESTRUCTIVE TESTING, *ULTRASONICS, ATTENUATION, FREQUENCY, EFFECTIVENESS, TEST METHODS,) (ALUMINUM, GRAINS (METALLURGY), MICROSTRUCTURE,)

AD-271 365 62-2-2 DIV. 30
OHIO STATE U. RESEARCH FOUNDATION, COLUMBUS.
DESCRIPTORS: (*NON-DESTRUCTIVE TESTING, *X-RAY PHOTOGRAPHY, RADIOGRAPHIC ANALYSIS, STEEL, GLASS TEXTILES, WELDED JOINTS, METAL JOINTS, ROCKET CASES, RELIABILITY, SENSITIVITY,) (TELEVISION EQUIPMENT, CAMERA TUBES, IMAGE INTENSIFIERS (ELECTRONICS), PHOTOELECTRIC MATERIALS, SELENIUM, BERYLLIUM, GOLD,)

*NOZZLES

AD-270 923 62-2-2 DIV. 9
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*JETS, *NOZZLES, THRUST, FLUID MECHANICS,)

*NUCLEAR EXPLOSIONS

AD-271 188 62-2-2 DIV. 6
MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*DETECTION OF *UNDERGROUND EXPLOSIONS, *NUCLEAR EXPLOSIONS *ITH DIGITAL COMPUTERS FROM DATA ON EARTHQUAKES,) (MAGNETIC RECORDING SYSTEMS, DIGITAL RECORDING SYSTEMS, DIGITAL SYSTEMS, SEISMIC WAVES,)

*NUCLEAR POWER PLANTS

AD-271 379 62-2-2 DIV. 20
NAVAL RESEARCH LAB., WASHINGTON, D. C.
DESCRIPTORS: (*NUCLEAR POWER PLANTS, MATERIALS, *STEEL, *RADIATION EFFECTS, *RADIATION DAMAGE, MECHANICAL PROPERTIES, STRESSES, TEMPERATURE.)

*NUCLEAR REACTIONS

AD-271 923 62-2-2 DIV. 20
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*BIBLIOGRAPHY, *NUCLEAR REACTIONS, THERMONUCLEAR REACTIONS, PHOTONUCLEAR REACTIONS, USSR.)

*OCEAN CURRENTS

AD-271 505 62-2-2 DIV. 2
NEW YORK U. COLL. OF ENGINEERING, N. Y.
DESCRIPTORS: (*OCEAN MODELS, *OCEAN CURRENTS, TEMPERATURE, WIND.) (ATLANTIC OCEAN, OCEANOGRAPHIC DATA, OCEANOGRAPHIC CHARTS.)

*OCEAN MODELS

AD-271 505 62-2-2 DIV. 2
NEW YORK U. COLL. OF ENGINEERING, N. Y.
DESCRIPTORS: (*OCEAN MODELS, *OCEAN CURRENTS, TEMPERATURE, WIND.) (ATLANTIC OCEAN, OCEANOGRAPHIC DATA, OCEANOGRAPHIC CHARTS.)

*OCEANOGRAPHICAL DATA

AD-271 543 62-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*HYDROLOGY, OCEANS, ARCTIC REGIONS.) (*OCEANOGRAPHICAL DATA, COLLECTING METHODS, USSR.) (OCEANOGRAPHICAL CHARTS, KARA SEA.)

*OPERATIONS RESEARCH

AD-270 939 62-2-2 DIV. 15
OPERATIONS ANALYSIS OFFICE, AIR FORCE, WASHINGTON, D. C.
DESCRIPTORS: (*OPERATIONS RESEARCH, GUIDED MISSILE RESEARCH, *STATISTICAL ANALYSIS, THEORY.) (GUIDED MISSILES, RESEARCH PROGRAM ADMINISTRATION.)

AD-270 960 62-2-2 DIV. 18
OPERATIONS ANALYSIS OFFICE, AIR FORCE, WASHINGTON, D. C.
DESCRIPTORS: (*OPERATIONS RESEARCH, *MILITRY OPERATIONS, CIVILIAN DEFENSE SYSTEMS, WARFAE, CONTROL.)

AD-271 444 62-2-2 DIV. 18
OPERATIONS RESEARCH OFFICE, JOHNS HOPKINS U., BETHESDA, MD.
DESCRIPTORS: (*OPERATIONS RESEARCH, *CIVILAN DEFENSE SYSTEMS, FOREIGN POLICY, *MILITARY GOVERNMENT.)

AD-271 549 62-2-2 DIV. 5
LABORATORIES FOR RESEARCH AND DEVELOPMENT, FRANKLIN INST., PHILADELPHIA, PA.
DESCRIPTORS: (*COMMUNICATION SYSTEMS, *MILITARY COMMUNICATIONS, *OPERATIONS RESEARCH, COLLECTING METHODS, DATA, MILITARY ORGANIZATIONS, INFORMATION THEORY.) (HUMAN ENGINEERING, ERRORS, RELIABILITY.)

*OPTICAL COATINGS

AD-271 358 62-2-2 DIV. 7
SPECTROLAB, INC., NORTH HOLLYWOOD, CALIF.
DESCRIPTORS: (SATELLITE VEHICLES, POWER SUPPLIES, SILICON, *SOLAR CELLS, *OPTICAL COATINGS, *INFRARED FILTERS, THEORY.) (TESTS, THERMODYNAMICS, WAVE TRANSMISSION, REFLECTION, BLACKBODY RADIATION, SPACE ENVIRONMENTAL CONDITIONS, STABILITY, RADIATION EFFECTS, BETA PARTICLES, INFRARED RADIATION.) (RARE EART, *RARE EARTH COMPOUNDS, FLUORIDES, OXYFLUORIDES.) (COATINGS, VAPOR PLATING.) (RESIN ADHESIVES, BONDING.)

AD-271 599 62-2-2 DIV. 14
SPECTROLAB, INC., NORTH HOLLYWOOD, CALIF.
DESCRIPTORS: (*SOLAR CELLS, *OPTICAL COATINGS, PROTECTIVE COVERINGS, OPTICAL FILTERS, TESTS, GLASS.) (POWER SUPPLIES, SOLAR ENERGY, SEMICONDUCTORS.)

*OPTICAL EQUIPMENT

AD-271 090 62-2-2 DIV. 30
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*RANGE, SIMULATION, *OPTICAL EQUIPMENT.) (BINOCULARS, TELESCOPES, TEST EQUIPMENT.) *COLLIMATORS.

*OPTICAL INSTRUMENTS

AD-271 403 62-2-2 DIV. 16
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
DESCRIPTORS: (OPHTHALMOLOGY, *OPTICAL INSTRUMENTS, RETINOSCOPES.) (LABORATORY EQUIPMENT, RADIATION INJURIES, BURNS, *RETINA.)

*OPTICAL SYSTEMS

AD-271 096 62-2-2 DIV. 28
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*OPTICAL SYSTEMS, VISION, VISIBILITY, DETECTION, *VISUAL PERCEPTION, TARGET RECOGNITION.) (MATHEMATICAL ANALYSIS, EQUATIONS, MATHEMATICAL PREDICTION.)

*ORDNANCE

AD-271 117 62-2-2 DIV. 8
NAVAL ORDNANCE TEST STATION, CHINA LAKE, CALIF.
DESCRIPTORS: (*RADIOFREQUENCY FILTERS, *LOW-PASS FILTERS, SUPPRESSORS, *RADIATION HAZARDS, DESIGN.) (EXPLOSIONS, EXPLOSIVE ACTUATORS, *ORDNANCE, *SAFETY, ELECTRIC IGNITERS, FIRING CIRCUITS, ELECTROMAGNETIC FIELDS, ELECTRICAL NETWORKS, RADIO INTERFERENCE, REDUCTION.)

*ORGANIC COMPOUNDS

AD-271 105 62-2-2 DIV. 4
IONICS, INC., CAMBRIDGE, MASS.
DESCRIPTORS: (*ORGANIC COMPOUNDS, *HYDROCARBONS, LIQUIDS, *PURIFICATION, SEPARATION.) (MIXTURES, HEPTANES WITH PENTANES OR CYCLOHEXANES OR BENZENES CYCLOHEXENES, ETHERS.) (DENSITY, PRESSURE, PHYSICAL PROPERTIES, CHROMATOGRAPHIC ANALYSIS.) (SEMIPERMEABILITY, FILMS, MEMBRANES, POLYMERS, ETHYLENES OR PROPENES.)

AD-271 121 62-2-2 DIV. 4
PRINCETON U., N. J.
DESCRIPTORS: (*ORGANIC COMPOUNDS, LIQUIDS, SOLIDS, *MOLECULAR STRUCTURE, *MOLECULAR ROTATION, RELAXATION TIME, MOLECULAR SPECTROSCOPY, *DIELECTRICS, *DIELECTRIC PROPERTIES, DIPOLE MOMENTS, VICOSITY, MECHANICAL PROPERTIES.) (ETHERS, AMINES, ALKOXY RADICALS, BENZENES, ALKYL RADICALS, HALIDES, QUINOLINES, QUINONES.) MICROWAVE SPECTROSCOPY.

*OSCILLATORS

AD-271 627 62-2-2 DIV. 8
DAVID SARNOFF RESEARCH CENTER, PRINCETON, N. .
DESCRIPTORS: (*CRYSTAL OSCILLATORS, ELECTRIC FIELDS, MAGNETIC FIELDS, TESTS, DESIGN.) (OSCILLATION, THEORY, MATHEMATICAL ANALYSIS) (*OSCILLATORS, CRYSTALS, GERMANIUM, SEMICONDUCTORS, SURFACE PROPERTIES.)

*OXIDATION INHIBITORS

AD-271 384 62-2-2 DIV. 14
DEFENSE METALS INFORMATION CENTER, COLUMBUS, OHIO.
DESCRIPTORS: (HIGH TEMPERATURE RESEARCH, *CERAMIC COATINGS AS *OXIDATION INHIBITORS FOR *REFRACTORY MATERIALS, *HEAT RESISTANT ALLOYS, METALS, MOLYBDENUM, MOLYBDENUM ALLOYS, NIOBIUM ALLOYS, TANTALUM ALLOYS, TUNGSTEN ALLOYS, VANADIUM ALLOYS.) (COATINGS OF SILICIDES, ALUMINUM COMPOUNDS, OXIDES, CERMETS, INTERMETALLIC COMPOUNDS, METAL COATINGS, BERYLLIUM COMPOUNDS.) (PROCESSING BY ELECTRODEPOSITION, CHEMICAL REACTIONS, DIFFUSION, FLAME SPRAYING.) (RE-ENTRY VEHICLES, SATELLITES, SPACESHIPS, GLIDERS, STRUCTURES, TURBOJET ENGINES, RAMJET ENGINES, ROCKET MOTORS, NUCLEAR PROPULSION.)

*OXIDE CATHODES

AD-271 101 62-2-2 DIV. 8
GENERAL TELEPHONE AND ELECTRONICS LABS., INC., BAYSIDE, N. Y.
DESCRIPTORS: (CATHODES (ELECTRON TUBES), *OXIDE CATHODES, DIODES, NICKEL, MATERIALS, *THERMIONIC EMISSION.) (OXIDE CATHODES, SUBLIMATION, MEASUREMENT.) (EVAPORATION, THIN FILMS, BARIUM, BARIUM COMPOUNDS, OXIDES, PLATINUM, NICKEL, TANTALUM.) (TUNGSTEN, ALUMINUM COMPOUNDS, OXIDES, CHEMICAL REACTIONS, TEMPERATURE.) MAGNETISM, POLARIZATION, MASS SPECTROSCOPY.

*OXIDES

AD-271 183 62-2-2 DIV. 14
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*DIELECTRICS, DIELECTRIC PROPERTIES, HIGH TEMPERATURE RESEARCH, VERY HIGH FREQUENCY, RADOMES, MISSILE WINDOWS.) (*CERAMIC MATERIALS, *ALUMINUM COMPOUNDS, *CXIDES, REINFORCING MATERIALS, *PLASTICS, RESONANCE, TEST METHODS.)

AD-271 588 62-2-2 DIV. 8
NARMCO INDUSTRIES, INC., SAN DIEGO, CALIF.
DESCRIPTORS: (*RADOMES, AIRBORNE, *CERAMIC MATERIALS, *ALUMINUM COMPOUNDS, *OXIDES, BONDING, *BRAZING, *ADHESIVES, HIGH TEMPERATURE RESEARCH.) (REFRACTORY MATERIALS, MOLYBDENUM ALLOYS, DIFFUSION, NICKEL, PLATINUM ALLOYS, PALLADIUM ALLOYS, GOLD ALLOYS, IRIDIUM ALLOYS, RUTHENIUM ALLOYS.) (COATINGS, MOLYBDENUM, FLAME SPRAYING, PLASMA JETS.) (METAL JOINTS, MICROSTRUCTURE.) EPOXY RESINS.

*OXYGEN

AD-271 116 62-2-2 DIV. 4
NAVAL RESEARCH LAB., WASHINGTON, D. C.
DESCRIPTORS: (LABORATORY EQUIPMENT, PRODUCTION, *OXYGEN BY ELECTROLYSIS, SULFURIC ACID AND CARBONATES, *CARBON DIOXIDE, ABSORPTION, DISPOSAL.) (ELECTROLYTIC CELLS, DESIGN.) AIR CONDITIONING, SUBMARINES.

AD-271 373 62-2-2 DIV. 10
AIR PRODUCTS AND CHEMICALS, INC., ALLENTOWN, PA.
DESCRIPTORS: (*OXYGEN, *LIQUEFIED GASES, *LIQUID ROCKET PROPELLANTS, ROCKET OXIDIZERS, CONTAMINATION, PURIFICATION, CHEMICAL IMPURITIES, HYDROCARBONS) (SOLIDIFIED GASES, CARBON DIOXIDE, HANDLING, SAFETY, *FUEL FILTERS, DESIGN.)

AD-271 417 62-2-2 DIV. 25
GENERAL ATOMIC DIV., GENERAL DYNAMICS CORP., SAN DIEGO, CALIF.
DESCRIPTORS: (*HYDROGEN, ATOMS, *OXYGEN, *HELIUM, *HEAT TRANSFER, *SCATTERING, PROTONS, *ATOMIC ENERGY LEVELS, RESONANCE.) (ION BEAMS, PHOTOELECTRIC CELLS, OSCILLOSCOPES, ELECTRON GUNS.)

AD-271 434 62-2-2 DIV. 25
*WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.
DESCRIPTORS: (AIR, *ELECTRONS, *IONS, *OXYGEN, ATOMS.) (ATMOSPHERE, ELECTRICAL PROPERTIES.) (ELECTRONS, DRIFT, MEASUREMENT.)

AD-271 582 62-2-2 DIV. 17
RESEARCH CHEMICALS, INC., BURBANK, CALIF.
DESCRIPTORS: (PHASE STUDIES, *YTTRIUM, *RARE EARTHS, *OXYGEN, SOLUBILITY, ERBIUM, NEODYMIUM, SAMARIUM, EUTECTICS, INTERMETALLIC COMPOUNDS, PHASE TRANSITIONS, METALLURGICAL ANALYSIS, GRAINS (METALLURGY), MECHANICAL PROPERTIES, TENSILE PROPERTIES, MICROSTRUCTURE.) (ALLOYS, METALS, PREPARATION, PURIFICATION, CORROSION RESEARCH.) (COBALT ALLOYS, NICKEL ALLOYS, TANTALUM ALLOYS, NIOBIUM ALLOYS, ZIRCONIUM ALLOYS, BERYLLIUM ALLOYS.) *RARE EARTH COMPOUNDS, *RARE EARTH ELEMENTS.

*PAINTS

AD-271 001 62-2-2 DIV. 10
NAVAL RESEARCH LAB., WASHINGTON, D. C.
DESCRIPTORS: (*FUEL STORAGE TANKS AND *PROPELLANT TANKS FOR LIQUID ROCKET PROPELLNTS AND ROCKET OXIDIZERS, STORAGE, HAZARDS, RELIABILITY.) (*PAINTS, COATINGS, *CHEMICAL INDICATORS.) NAVAL VESSELS.

*PANEL BOARDS (ELECTRICITY)

AD-271 354 62-2-2 DIV. 8
RADIATION, INC., MELBOURNE, FLA.
DESCRIPTORS: (*PANEL BOARD (ELECTRICITY), ELECTRONIC EQUIPMENT, *SWITCHING CIRCUITS, NEGATIVE RESISTANCE CIRCUITS, ELECTRONIC CIRCUITS, IMPEDANCE, AUTOMATIC, DIODES, *ELECTRONIC SWITCHES, SOLID STATE PHYSICS, INTERFERENCE, DESIGN, MULTICHANNEL TELEPHONE SYSTEMS.)

*PARACHUTE FABRICS

AD-270 928 62-2-2 DIV. 14
MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*PARACHUTE FABRICS, PARACHUTS, GAS FLOW, HIGH ALTITUDE, STRESSES, TESTS, MATHEMATICAL ANALYSIS.)

*PARAMAGNETIC CRYSTALS

AD-271 559 62-2-2 DIV. 25
RADIATION LAB., JOHNS HOPKINS U., BALTIMORE, MD.
DESCRIPTORS: (*PARAMAGNETIC CRYSTALS, PARAMAGNETIC SALTS, *POTASSIUM COMPOUNDS, COBALT COMPOUNDS, *IRON COMPOUNDS, *CYANIDES, *RELAXATION TIME, NUCLEAR SPINS, TEMPERATURE, LOW TEMPERATURE RESEARCH, SPECTROGRAPHIC ANALYSIS, *PARAMAGNETIC RESONANCE, THEORY.) MASERS.

*PARAMAGNETIC RESONANCE

AD-271 100 62-2-2 DIV. 25
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: *MASERS, *BIBLIOGRAPHY, *MICROWAVE AMPLIFIERS, *FREQUENCY STABILIZERS, USSR, ELECTRONICS, SCIENTIFIC RESEARCH, *RUBY, *PARAMAGNETIC RESONANCE, CRYOGENICS, PARAMETRIC AMPLIFIERS.

AD-271 559 62-2-2 DIV. 25
RADIATION LAB., JOHNS HOPKINS U., BALTIMORE, MD.
DESCRIPTORS: (*PARAMAGNETIC CRYSTALS, PARAMAGNETIC SALTS, *POTASSIUM COMPOUNDS, COBALT COMPOUNDS, *IRON COMPOUNDS, *CYANIDES, *RELAXATION TIME, NUCLEAR SPINS, TEMPERATURE, LOW TEMPERATURE RESEARCH, SPECTROGRAPHIC ANALYSIS, *PARAMAGNETIC RESONANCE, THEORY.) MASERS.

*PARAMETRIC AMPLIFIERS

AD-271 100 62-2-2 DIV. 25
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: *MASERS, *BIBLIOGRAPHY, *MICROWAVE AMPLIFIERS, *FREQUENCY STABILIZERS, USSR, ELECTRONICS, SCIENTIFIC RESEARCH, *RUBY, *PARAMAGNETIC RESONANCE, CRYOGENICS, PARAMETRIC AMPLIFIERS.

*PARTICLE ACCELERATORS

AD-270 922 62-2-2 DIV. 25
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*PLASMA PHYSICS, *PARTICLE ACCELERATORS, DESIGN, GASES, GAS FLOW, IONIZATION, *MAGNETOHYDRODYNAMICS, *SUPERSONIC FLOW.) (VELOCITY, MEASUREMENT.) (ARGON, MERCURY, VAPORS, ALTERNATING CURRENT, DIRECT CURRENT, PRESSURE, ELECTRIC ARCS, GLOW DISCHARGES, CATHODES.) (HIGH TEMPERATURE RESEARCH, ELECTROMAGNETIC FIELDS, THERMODYNAMICS, MAGNETIC FIELDS.)

*PARTICLES

AD-271 470 62-2-2 DIV. 25
UTAH U., SALT LAKE CITY.
DESCRIPTORS: (*PARTICLES, *PELLETS, *HYPERSONICS, VELOCITY, *IMPACT SHOCK, METEOROLOGY, PARTICLE ACCELERATORS, *METALS.) (SATELLIT VEHICLES, EROSION.) (PELLETS, ACCELERATION.)

(PARTICLES, HYDROGEN, ATOMS, SCATTERING, COPPER, ARGON.) FEASIBILITY STUDIES, SPECTROGRAPHIC ANALYSIS.

*PELLETS

AD-271 470 62-2-2 DIV. 25
UTAH U., SALT LAKE CITY.
DESCRIPTORS: (*PARTICLES, *PELLETS, *HYPERSONICS, VELOCITY, *IMPACT SHOCK, METEOROLOGY, PARTICLE ACCELERATORS, *METALS.) (SATELLIT VEHICLES, EROSION.) (PELLETS, ACCELERATION.) (PARTICLES, HYDROGEN, ATOMS, SCATTERING, COPPER, ARGON.) FEASIBILITY STUDIES, SPECTROGRAPHIC ANALYSIS.

*PENETRATION

AD-270 930 62-2-2 DIV. 22
BUREAU OF MINES, PITTSBURGH, PA.
DESCRIPTORS: (*HYPERVELOCITY PROJECTILES, AMMUNITION FRAGMENTS, PARTICLES, HYPERSONICS, TERMINAL BALLISTICS, EFFECTIVENESS, ALUMINUM ALLOYS, ALLOYS, METAL PLATES, SHEETS, FAILURE (MECHANICS), *PENETRATION, *CRATERING, SPALLATION.) (ANALYSIS OF CRATERING OF HYPERVELOCITY PROJECTILES.) (TEST EQUIPMENT FOR ACCELERATION OF HYPERVELOCITY PROJECTILS, DESIGN.)

*PERCHLORATES

AD-270 929 62-2-2 DIV. 10
ATLANTIC RESEARCH CORP., ALEXANDRIA, VA.
DESCRIPTORS: (*SOLID ROCKET PROPELLANTS, *ROCKET OXIDIZERS, *COMBUSTION, IGNITION, REACTION KINETICS, FLAMES, FLAME PROPAGATION, PRESSURE, THEORY, DECOMPOSITION, THERMOCHEMISTRY.) (*PERCHLORIC ACIDS, VAPORS, CHEMICAL REACTIONS, AMMONIA.) (AMMONIUM RADICALS, POTASSIUM COMPOUNDS, *PERCHLORATES AND METHANES, MIXTURES OF BINDERS, POLYMERS, VINYLCHLORIDES, CARBOXYLIC ACIDS.)

AD-271 592 62-2-2 DIV. 4
STANDOTTE CHEMICALS CORP., MICH.
DESCRIPTORS: (*ESTERS, *ALKYL RADICALS, *PERCHLORATES, SYNTHESIS, CHEMICAL REACTION, ALKYL RADICALS, IODIDES, SILVER COMPOUNDS, PERCHLORATES, COMPLEX COMPOUNDS, UREA, MOLECULAR STRUCTURE, STABILITY.) (X-RAY DIFFRACTION ANALYSIS, INFRARED SPECTROSCOPY.) EXPLOSIVS.

*PERCHLORIC ACID

AD-270 929 62-2-2 DIV. 10
ATLANTIC RESEARCH CORP., ALEXANDRIA, VA.
DESCRIPTORS: (*SOLID ROCKET PROPELLANTS, *ROCKET OXIDIZERS, *COMBUSTION, IGNITION, REACTION KINETICS, FLAMES, FLAME PROPAGATION, PRESSURE, THEORY, DECOMPOSITION, THERMOCHEMISTRY.) (*PERCHLORIC ACIDS, VAPORS, CHEMICAL REACTIONS, AMMONIA.) (AMMONIUM RADICALS, POTASSIUM COMPOUNDS, *PERCHLORATES AND METHANES, MIXTURES OF BINDERS, POLYMERS, VINYLCHLORIDES, CARBOXYLIC ACIDS.)

*PERSONALITY

AD-271 388 62-2-2 DIV. 28
EDUCATIONAL TESTING SERVICE, PRINCETON, N. J.
DESCRIPTORS: (*INDUSTRIAL PSYCHOLOGY, *PERSONALITY, *PERSONALITY TESTS, BEHAVIOR, ACHIEVEMENT TESTS, RELIABILITY.)

*PERSONALITY TESTS

AD-271 148 62-2-2 DIV. 28
EDUCATIONAL TESTING SERVICE, PRINCETON, N. J.
DESCRIPTORS: (*APTITUDE TESTS, *PERSONALITY TESTS, STATISTICAL ANALYSIS, *MATHEMATICAL PREDICTION, COMPUTERS.)

AD-271 387 62-2-2 DIV. 28
EDUCATIONAL TESTING SERVICE, PRINCETON, N. J.
DESCRIPTORS: (*INDUSTRIAL PSYCHOLOGY, ACHIEVEMENT TESTS, APTITUDE TESTS, *PERSONALITY TESTS, *FACTOR ANALYSIS, JOB ANALYSIS, TEST METHODS.) (BEHAVIOR, ATTITUDES, LEADERSHIP.)

AD-271 388 62-2-2 DIV. 28
EDUCATIONAL TESTING SERVICE, PRINCETON, N. J.
DESCRIPTORS: (*INDUSTRIAL PSYCHOLOGY, *PERSONALITY, *PERSONALITY TESTS, BEHAVIOR, ACHIEVEMENT TESTS, RELIABILITY.)

*PHASE SHIFTERS

AD-271 408 62-2-2 DIV. 8
MICROWAVE ASSOCIATES, INC., BURLINGTON, MASS.
DESCRIPTORS: (*PHASE SHIFTERS, *SEMICONDUCTORS, MICROWAVE EQUIPMENT, L BAND, ELECTRONIC CIRCUITS, ELECTRONIC SCANNERS, DIODES, WAVE-

*PHASE STUDIES

AD-271 580 62-2-2 DIV. 17
MANUFACTURING LABS., INC., CAMBRIDGE, MASS.
DESCRIPTORS: (HIGH PRESSURE RESEARCH, HIGH TEMPERATURE RESEARCH, METALLURGY, *PHASE STUDIES.) (HYDROSTATIC PRESSURE, PHASE TRANSITIONS, *IRON ALLOYS, CHROMIUM ALLOYS, NICKEL ALLOYS, SILICON ALLOYS.) (IRON ALLOYS, *CARBON ALLOYS, AUSTENITE.) (*MOLYBDENUM COMPOUNDS, *CARBIDES, SYNTHESIS.) (COPPER, *BRASS, MICROSTRUCTURE, STRESSES, REACTION KINETICS, RELAXATION TIME.) (*ALUMINUM COMPOUNDS, OXIDES, SINTERING.) (CERIUM, HALL EFFECT, MEASUREMENT.) (BRITTLE MATERIALS, ALLOYS, METALS, TEST EQUIPMENT, X-RAY DIFFRACTION ANALYSIS.

*PHASE TRANSITIONS

AD-270 904 62-2-2 DIV. 17
ILLINOIS U., URBANA.
DESCRIPTORS: (*IRON ALLOYS, NICKEL ALLOYS, *AUSTENITE, *MARTENSITE, *PHASE TRANSITIONS PHASE STUDIES, MICROSTRUCTURE, CRYSTAL STRUCTURE, LATTICES, TRANSITION TEMPERATURE, X-RAY DIFFRACTION ANALYSIS.) ALLOYS.

*PHOSPHIDES

AD-271 629 62-2-2 DIV. 25
DAVID SARNOFF RESEARCH CENTER, PRINCETON, N. .
DESCRIPTORS: (*SOLAR CELLS, RADIATION DAMAGE, TESTS.) (SILICON, *GALLIUM COMPOUNDS, *ARSENIDES, *PHOSPHIDES, CHEMICAL IMPURITIES, PHOSPHORUS, ZINC, BORON, INDIUM, GALLIUM.) (PHOTONS, SUN.)

*PHOSPHINES

AD-271 587 62-2-2 DIV. 25
NAVAL ORDNANCE LAB., CORONA, CALIF.
DESCRIPTORS: (*TELEPHONE COMMUNICATION SYSTEMS, PANEL BOARDS (ELECTRICITY), NOISE GENERATORS, THEORY, DESIGN,) (*FERROMAGNETSM, *IRON ALLOYS, *NICKEL ALLOYS, FILMS,) (*RARE GASES, INFRARED SPECTROSCOPY, INTERFEROMETERS, ELECTROMAGNETIC WAVES, WAVE TRANSMISSION.) (*SEMICONDUCTORS, *SILICON, MAGNETO-OPTIC ACTATION.) (*HEAT RESISTANT POLYMERS, *POLYMERS, *PHOSPHINES, PHENYL RADICALS, CHLORIDES, SYNTHESIS, CHEMICAL REACTIONS,) (SOLID STATE PHYSICS, *MICROWAVE OSCILLATORS, *DIODES, *RARE EARTH COMPOUNDS, CALCIUM COMPOUNDS, FLUORIDES, *THULIUM COMPOUNDS, SPECTROPHOTOMETERS, ABSORPTION, FLUORESCENCE, CRYSTALS,) (*GUIDED MISSILE ANTENNAS, *SLOT ANTENNAS, *WAVEGUIDE SLOTS, DIELECTRICS, ANTENNA RADIATION PATTERNS, MEASUREMENT,)

*PHOTOCHEMICAL REACTIONS

AD-271 597 62-2-2 DIV. 10
ARMOUR RESEARCH FOUNDATION, CHICAGO, ILL.
DESCRIPTORS: (*LIQUID ROCKET PROPELLANTS, *NITROGLYCERINE, SENSITIVITY, DETONATION, TESTS.) (TEST METHODS, VAPOR PRESSURE, SURFACE TENSION, HEATING, HEAT TRANSFER, *PHOTOLYSIS, XENON LAMPS, INFRARED RADIATION, ULTRAVIOLET RADIATION, *PHOTOCHEMICAL REACTIONS.) (ABSORPTION, WATER.) (TIME, TEMPERATURE, PRESSURE, SHOCK TUBES.)

*PHOTOCONDUCTIVITY

AD-271 626 62-2-2 DIV. 6
STRAZA INDUSTRIES, EL CAJON, CALIF.
DESCRIPTORS: (*DISPLAY SYSTEMS, *SONAR, SONAR EQUIPMENT, OPTICAL FILTERS, LUMINESCECE, BRIGHTNESS, SOLID STATE PHYSICS, *PHOTOCONDUCTIVITY, THIN FILMS, MATERIALS, COATINGS, DESIGN, TEST EQUIPMENT, PRODUCTION, TIN COMPOUNDS, OXIDES.)

*PHOTOELECTRIC SHUTTERS

AD-271 520 62-2-2 DIV. 26
PHILCO CORP., BLUE BELL, PA.
DESCRIPTORS: (PHOTOELECTRIC MATERIALS, *GOGGLES FOR THEORY, DESIGN,) (*ELECTROPLATINGOF METAL FILMS, SILVER ALLOYS, SODIUM ALLOYS ON GLASS ELECTRODES, CERAMIC COATINGS, TIN COMPOUNDS, OXIDES, ELECTRICAL CONDUCTANCE FOR CONTROL OF LIGHT TRANSMISSION AND REFLECTION,) (ELECTROLYTES, SOLUTIONS, SILVER COMPOUNDS, SODIUM COMPOUNDS, IODIDES, ELECTRIC CURRENTS, ELECTRIC POTENTIAL,) (LENSES, DISPLAY SYSTEMS, TRANSPARENT PANELS, SPACE ENVIRONMENTAL CONDITIONS,) SAFETY, *PHOTOELECTRIC SHUTTERS.

*PHOTOFLASH BOMBS

AD-271 439 62-2-2 DIV. 2
GEORAUTICS, INC., WASHINGTON, D. C.
DESCRIPTORS: (GEODESICS, *GEODETIC ASTRONOMY, HIGH ALTITUDE, *PHOTOFLASH BOMBS IN SOUNDING ROCKETS FOR POSITION FINDING, *BRIDGES, RANGE CONTROL SYSTEMS FOR *MAPPING,) (TRIGNOPETRY, *PATRIX ALGEBRA, ERRORS, MATHEMATICAL ANALYSIS,) (GEODETIC DATA, DATA PROCESSING SYSTEMS,)

*PHOTOLYSIS

AD-271 563 62-2-2 DIV. 30
LUND U. (SWEDEN).
DESCRIPTORS: (*PHOTOLYSIS, ORGANIC SOLVENTS, METHYL RADICALS, PENTANES, CARBON COMPOUNDS, SULFIDES, ETHYL RADICALS, IODIDES,) (*SPECTROPHOTOMETERS, DESIGN, LOW TEMPERATURE RESEARCH, *THERMOCHEMISTRY, *CHEMICAL BONDS, *RECOMBIATION REACTIONS, *FREE RADICALS,) SWEDEN.

AD-271 597 62-2-2 DIV. 10
ARMOUR RESEARCH FOUNDATION, CHICAGO, ILL.
DESCRIPTORS: (*LIQUID ROCKET PROPELLANTS, *NITROGLYCERINE, SENSITIVITY, DETONATION, TESTS.) (TEST METHODS, VAPOR PRESSURE, SURFACE TENSION, HEATING, HEAT TRANSFER, *PHOTOLYSIS, XENON LAMPS, INFRARED RADIATION, ULTRAVIOLET RADIATION, *PHOTOCHEMICAL REACTIONS.) (ABSORPTION, WATER.) (TIME, TEMPERATURE, PRESSURE, SHOCK TUBES.)

*PHOTOMETERS

AD-271 091 62-2-2 DIV. 30
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*STARS, BRIGHTNESS, MEASUREMENT, *PHOTOMETERS, MOBILE.)

AD-271 092 62-2-2 DIV. 30
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*UNDERWATER, *LIGHT, MEASUREMENT, *PHOTOMETERS.)

AD-271 094 62-2-2 DIV. 30
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*PHOTOMETERS, PHOTOMULTIPLIERS, PHOTOTUBES, POTENTIOMETERS, PHOTOGRAPHIC RECORDING SYSTEMS, RECORDING DEVICES, ELECTRONIC CIRCUITS, DESIGN.)

AD-271 095 62-2-2 DIV. 30
DUNTLEY, S.Q., LA JOLLA, CALIF.
DESCRIPTORS: (*PHOTOMETERS, PHOTOMULTIPLIES, PHOTOTUBES, POTENTIOMETERS, RECORDING DEVICS, TESTS, CALIBRATION.)

AD-271 137 62-2-2 DIV. 30
AERCPHYSICS LAB., MASS. INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*NIGHT SKY, LUMINESCENCE, INFRARED RADIATION, MEASUREMENT BY *PHOTOMETERS IN AIRCRAFT SEARCHLIGHTS,) (PHOTOMULTIPLIERS, COOLING,) ROTARY SHUTTERS, LIGHT COMMUNICATION SYSTEMS.

*PHOTOMULTIPLIERS

AD-271 545 62-2-2 DIV. 30
AERCSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*SPECTROPHOTOMETERS, REFLECTOMETERS,) (*PHOTOMULTIPLIERS WITH AMPLIFIERS,)

*PHYSICS

AD-271 648 62-2-2 DIV. 25
QUEEN'S U., BELFAST (GT. BRIT.).
DESCRIPTORS: (*UPPER ATMOSPHERE, *PHYSICS, SCIENTIFIC RESEARCH,) GREAT BRITAIN.

*PIONS

AD-270 903 62-2-2 DIV. 20
RIAS, INC., BALTIMORE, MD.
DESCRIPTORS: (PARTICLES, *PIONS, ENERGY, *SCATTERING, RESONANCE ABSORPTION, WAVE ANALYSIS, RESONANCE SCATTERING, DIFFRACTION,) (POLYNOMIALS, INTEGRALS, ALGEBRAIC TOPOLOGY,)

*PLASMA OSCILLATIONS

AD-271 004 62-2-2 DIV. 2
MICROWAVE LAB., STANFORD U., CALIF.
DESCRIPTORS: (*ASTROPHYSICS, ELECTROMAGNETC WAVES, *PLASMA OSCILLATIONS, THERMAL RADIATION, PLASMA PHYSICS,) (SHOCK WAVES, MAGNETOHYDRODYNAMICS,) (EXTRATERRESTRIAL RADIO WAVES, MAGNETIC STORMS, *SOLAR FLARES, SOLAR CORONA, TERRESTRIAL MAGNETISM, GAS IONIZATION,) (HARMONIC ANALYSIS, NONLINEAR SYSTEMS,)

*PLASMA PHYSICS

AD-270 922 62-2-2 DIV. 25
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*PLASMA PHYSICS, *PARTICLE ACCELERATORS, DESIGN, GASES, GAS FLOW, IONIZATION, *MAGNETOHYDRODYNAMICS, *SUPERSONIC FLOW,) (VELOCITY, MEASUREMENT,) (ARGON, MERCURY, VAPORS, ALTERNATING CURREN, DIRECT CURRENT, PRESSURE, ELECTRIC ARCS, GLOW DISCHARGES, CATHODES,) (HIGH TEMPERATURE RESEARCH, ELECTROMAGNETIC FIELDS, THERMODYNAMICS, MAGNETIC FIELDS,)

AD-271 157 62-2-2 DIV. 25
ANTENNA LAB., OHIO STATE U., RESEARCH FOUNDATION, COLUMBUS.
DESCRIPTORS: (*PLASMA PHYSICS, HYPERSONICS, HYPERSONIC FLOW, THEORY, ELECTROMAGNETIC WAVES, *WAVE TRANSMISSION, ANTENNAS, DIPOLE ANTENNAS, SLOT ANTENNAS, TEST FACILITIES, HYPERSONIC WIND TUNNELS, SHOCK TUBES,)

AD-271 158 62-2-2 DIV. 25
ANTENNA LAB., OHIO STATE U. RESEARCH FOUNDATION, COLUMBUS.
DESCRIPTORS: (*INFRARED RADIATION, MOLECULS, NITROGEN, IONS, *PLASMA PHYSICS,) (NITRODE, MOLECULES, MOLECULAR STRUCTURE, OSCILLATION) (INFRARED RESEARCH, *INFRARED COMMUNICATION SYSTEMS,) (QUANTUM MECHANICS, ELECTROMAGNETIC WAVES,)

AD-271 170 62-2-2 DIV. 25
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: (*PLASMA PHYSICS, *MAGNETOHYDRODYNAMICS, *BIBLIOGRAPHY, PLASMA JETS, PLASMA OSCILLATIONS, RE-ENTRY AERODYNAMICS, ATMOSPHERE ENTRY, INSTRUMENTATION, ELECTROMAGNETIC WAVES, SHOCK WAVES, MICROWAVES, GAS IONIZATION, MAGNETIC PINCH, PROPELLANTS, PROPULSION,

AD-271 423 62-2-2 DIV. 8
GIANNINI SCIENTIFIC CORP., SANTA ANA, CALIF.
DESCRIPTORS: (*GASES, *ELECTRIC DISCHARGES, GAS DISCHARGES, *GAS IONIZATION, THERMONUCLEAR REACTIONS, MAGNETIC FIELDS, *PLASMA PHYSICS, HYDROGEN, ARGON.) (DISCHARGE TUBES, INSTRUMENTATION.) (ELECTRONS, DIFFUSION.)

AD-271 424 62-2-2 DIV. 8
GIANNINI SCIENTIFIC CORP., SANTA ANA, CALIF.
DESCRIPTORS: (*GASES, *ELECTRIC DISCHARGES, GAS DISCHARGES, *GAS IONIZATION, THERMONUCLEAR REACTIONS, MAGNETIC FIELDS, *PLASMA PHYSICS, HYDROGEN, ARGON.) (INSTRUMENTATION, OSCILLOSCOPES, PHOTOMULTIPLIERS, PHOTOGRAPHY.)

AD-271 479 62-2-2 DIV. 25
INSTITUTE FOR FLUID DYNAMICS AND APPLIED MATHEMATICS, U. OF MARYLAND, COLLEGE PARK.
DESCRIPTORS: (*PLASMA PHYSICS, MAGNETIC FIELDS, IONS, WAVE TRANSMISSION, *MAGNETOHYDRODYNAMICS, PERTURBATION THEORY.)

AD-271 512 62-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*IONOSPHERE, IONIZATION.) (*AURORAE, NIGHT SKY, LUMINESCENCE.) (*SOLAR CORONA, SOLAR FLARES, POLARIZATION.) VAN ALLEN RADIATION BELT, *COSMIC RAYS, *ATMOSPHERIC ELECTRICITY, *PLASMA PHYSICS.

AD-271 646 62-2-2 DIV. 9
INSTITUTE OF ENGINEERING RESEARCH, U. OF CALIF., BERKELEY.
DESCRIPTORS: (*SUPERSONIC FLOW, *GAS IONIZATION, *FLUID MECHANICS, *PLASMA PHYSICS.) (DIFFUSION, PRESSURE, *BOUNDARY LAYER.) (SHOCK WAVES, IONS, DENSITY, TEMPERATURE, COOLING.) (WIND TUNNELS, ELECTRIC ARCS, HEATING.) DIFFERENTIAL EQUATIONS.

*PLASTICS

AD-270 981 62-2-2 DIV. 16
PLASTICS LAB., PRINCETON U., N. J.
DESCRIPTORS: (*POLYMERS, *PLASTICS, *FERROCENES, *DIELECTRICS, *SEMICONDUCTORS, ORGANIC MATERIALS, DIELECTRIC PROPERTIES, ELECTRICAL PROPERTIES, CONDUCTIVITY, SYNTHESIS, MECHANICAL PROPERTIES, PHASE STUDIES, VISCOSITY, TEST METHODS, PRESSURE.) (POLYMERIZATION, ETHYLENES, ORGANIC COMPOUNDS, VINYL RADICALS, ALLYL RADICALS.) (BUTADIENES, BUTENES, PROPENES.) METHODS, PRESSURE.) (POLYMERIZATION, ETHYLENES, ORGANIC COMPOUNDS, VINYL RADICALS, ALLYL RADICALS.) (BUTADIENES, BUTENES, PROPENES.)

AD-271 166 62-2-2 DIV. 1
BOEING CO., WICHITA, KANSAS.
DESCRIPTORS: (*AIRFRAMES, *MATERIALS, *METALS, *ALLOYS, TITANIUM ALLOYS, EXTRUSION, *CERAMIC COATINGS, *REFRACTORY COATINGS, FLAME SPRAYING, SEALING COMPOUNDS, ELASTOMERS, *PLASTICS, EXPANDED PLASTICS, *ADHESIVES, RESIN ADHESIVES, SANDWICH CONSTRUCTION, HONEYCOMB CORES, LAMINATES, HOSES.) (MECHANICAL PROPERTIES, TENSILE PROPERTIES, CLIMATIC FACTORS, FAILURE (MECHANICS), HIGH TEMPERATURE RESEARCH.) (POLYMERS, FLUORIDES, FLUOROCARBONS, SILICONES, SILANES, URETHANES, PYRIMIDINES.)

AD-271 176 62-2-2 DIV. 14
GENERAL DYNAMICS/ASTRONAUTICS, SAN DIEGO, CALIF.
DESCRIPTORS: (*HIGH TEMPERATURE RESEARCH, NIOBIUM ALLOYS, *ALLOYS, *REFRACTORY MATERIALS, REFRACTORY COATINGS.) (*LOW TEMPERATURE RESEARCH, *ADHESIVES, METALS, THERMAL INSULATION, ALLOYS, STAINLESS STEEL, AUSTENITE.) (MECHANICAL PROPERTIES, DEFORMATION, PLASTICITY, NUCLEAR REACTIONS, RADIATION EFFECTS.) (*PLASTICS, *FLUOROCARBONS, CERAMIC MATERIALS.)

AD-271 183 62-2-2 DIV. 14
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*DIELECTRICS, DIELECTRIC PROPERTIES, HIGH TEMPERATURE RESEARCH, VERY HIGH FREQUENCY, RADOMES, MISSILE WINDOWS.) (*CERAMIC MATERIALS, *ALUMINUM COMPOUNDS, *OXIDES, REINFORCING MATERIALS, *PLASTICS, RESONANCE, TEST METHODS.)

*POLYMERS

AD-270 956 62-2-2 DIV. 4
MELLON INST. OF INDUSTRIAL RESEARCH, PITTSBURGH, PA.
DESCRIPTORS: (*POLYMERS, *ETHYLENES, OXIDES, *STYRENES, CRYSTALS, CRYSTAL STRUCTURE, MOLECULAR WEIGHT, PHYSICAL PROPERTIES, VISCOSITY, MECHANICAL PROPERTIES, MOLECULAR STRUCTURE, STABILITY, SYNTHESIS, POLYMERIZATION, FREE RADICALS, IONS.) (TEST METHODS, TEST EQUIPMENT, TORSION METERS, X-RAY DIFFRACTION ANALYSIS.)

AD-270 981 62-2-2 DIV. 14
PLASTICS LAB., PRINCETON U., N. J.
DESCRIPTORS: (*POLYMERS, *PLASTICS, *FERROCENES, *DIELECTRICS, *SEMICONDUCTORS, ORGANIC MATERIALS, DIELECTRIC PROPERTIES, ELECTRICAL PROPERTIES, CONDUCTIVITY, SYNTHESIS, MECHANICAL PROPERTIES, PHASE STUDIES, VISCOSITY, TEST METHODS, PRESSURE.) (POLYMERIZATION, ETHYLENES, ORGANIC COMPOUNDS, VINYL RADICALS, ALLYL RADICALS.) (BUTADIENES, BUTENES, PROPENES.) METHODS, PRESSURE.) (POLYMERIZATION, ETHYLENES, ORGANIC COMPOUNDS, VINYL RADICALS, ALLYL RADICALS.) (BUTADIENES, BUTENES, PROPENES.)

AD-271 587 62-2-2 DIV. 25
NAVAL ORDNANCE LAB., CORONA, CALIF.
DESCRIPTORS: (*TELEPHONE COMMUNICATION SYSTEMS, PANEL BOARDS (ELECTRICITY), NOISE GENERATORS, THEORY, DESIGN.) (*FERROMAGNETISM, *IRON ALLOYS, *NICKEL ALLOYS, FILMS.) (*RARE GASES, INFRARED SPECTROSCOPY, INTERFEROMETERS, ELECTROMAGNETIC WAVES, WAVE TRANSMISSION.) (*SEMICONDUCTORS, *SILICON, MAGNETO-OPTIC ROTATION.) (*HEAT RESISTANT POLYMERS, *POLYMERS, *PHOSPHINES, PHENYL RADICALS, CHLORIDES, SYNTHESIS, CHEMICAL REACTIONS.) (SOLID STATE PHYSICS, *MICROWAVE OSCILLATORS, *DIODES, *RARE EARTH COMPOUNDS, CALCIUM COMPOUNDS, FLUORIDES, *THULIUM COMPOUNDS, SPECTROPHOTOMETERS, ABSORPTION, FLUORESCENCE, CRYSTALS.) (*GUIDED MISSILE ANTENNAS, *SLOT ANTENNAS, *WAVEGUIDE SLOTS, DIELECTRICS, ANTENNA RADITION PATTERNS, MEASUREMENT.)

*POSITRONIUM

AD-271 389 62-2-2 DIV. 20
SARAH MELLON SCAIFE RADIATION LAB., U. OF PITTSBURGH, PA.
DESCRIPTORS: (*ELECTRONS, NUCLEAR PHYSICS, NUCLEAR ENERGY, GASES, *POSITRONIUM, ELECTRIC FIELDS, PARTICLES, MAGNETIC FIELDS, SCATTERING, POLARIZATION.) (*ATOMIC ORBITALS, MOMENTS, BETA RAY PARTICLES, GAMMA RAYS, ARGON, NITROGEN, OXYGEN.) (GEOMETRY, MATHEMATICAL ANALYSIS.)

*POTASSIUM COMPOUNDS

AD-271 559 62-2-2 DIV. 25
RADIATION LAB., JOHNS HOPKINS U., BALTIMORE, MD.
DESCRIPTORS: (*PARAMAGNETIC CRYSTALS, PARAMAGNETIC SALTS, *POTASSIUM COMPOUNDS, COBALT COMPOUNDS, *IRON COMPOUNDS, *CYANIDES, *RELAXATION TIME, NUCLEAR SPINS, TEMPERATURE, LOW TEMPERATURE RESEARCH, SPECTROGRAPHIC ANALYSIS, *PARAMAGNETIC RESONANCE, THEORY.) MASERS.

*POTATOES

AD-271 381 62-2-2 DIV. 29
NAVAL SUPPLY RESEARCH AND DEVELOPMENT FACILITY, BAYONNE, N. J.
DESCRIPTORS: (*DEHYDRATED SUBSTANCES, *MILITARY RATIONS, *POTATOES, COSTS, STORAGE.)

*POWER AMPLIFIERS

AD-271 619 62-2-2 DIV. 8
RADIO CORP. OF AMERICA, LANCASTER, PA.
DESCRIPTORS: (*TETRODES, *POWER AMPLIFIERS, RADIOFREQUENCY POWER, VERY HIGH FREQUENCY.) (CIRCUITS, DESIGN, VERY HIGH FREQUENCY.) *IMPEDANCE MATCHING.

*POWER REACTORS

AD-271 611 62-2-2 DIV. 20
CORNELL U., ITHACA, N. Y.
DESCRIPTORS: (*TEST REACTORS, *POWER REACTORS, DESIGN.) (REACTOR CORES, CONTROL RODS.)

*POWER SUPPLIES

AD-271 005 62-2-2 DIV. 7
PENNSYLVANIA STATE U. MINERAL INDUSTRIES EXPERIMENT STATION, UNIVERSITY PARK.
DESCRIPTORS: (*FUEL CELLS, OXIDATION-REDUCTION REACTIONS, *TIN COMPOUNDS, CHLORIDES, HYDROCHLORIC ACID, FORMALDEHYDE, HEATING.) (MASS SPECTROSCOPY, QUANTITATIVE ANALYSIS, GASES, CARBON DIOXIDE, METHANES, CARBON COMPOUNDS, OXIDES.) *POWER SUPPLIES, ELECTROCHEMISTRY.

AD-271 180 62-2-2 DIV. 7
NATIONAL CARBON CO., INC., CLEVELAND, OHIO.
DESCRIPTORS: (FEASIBILITY STUDIES, *PRIMARY BATTERIES, *POWER SUPPLIES.) (PULSE HEIGHT ANALYZERS, SCINTILLATION COUNTERS, RADIOACTIVITY, SILVER COMPOUNDS, CHLORIDES, POTASSIUM COMPOUNDS, LITHIUM COMPOUNDS, CHLORIDES.) (*CATHODES (ELECTROLYTIC CELL), COPPER COMPOUNDS, SULFIDES, IRON COMPOUNDS, SULFIDES, DEGASIFICATION.)

*PREFABRICATED BUILDINGS

AD-270 956 62-2-2 DIV. 13
ARMY ENGINEER RESEARCH AND DEVELOPMENT LABS., FORT BELVOIR, VA.
DESCRIPTORS: (*PREFABRICATED BUILDINGS, MILITARY REQUIREMENTS, AIR TRANSPORTATION, CONSTRUCTION, LIGHTING EQUIPMENT, HEATING, LIGHTING SYSTEMS, BUILDINGS, ROOFS.)

*PRESSURE GAGES

AD-270 958 62-2-2 DIV. 30
PARAMETRICS, INC., SAXONVILLE, MASS.
DESCRIPTORS: (*PRESSURE GAGES, *TRANSDUCERS, PHOTOELECTRIC CELLS, ELECTRODES, PHOTOCONDUCTIVITY, LUMINESCENCE, PHOSPHORS, DIELECTRIC PROPERTIES, CRYSTALS, DESIGN, MATHEMATICAL ANALYSIS.)

*PRESSURIZED WATER REACTORS

AD-271 023 62-2-2 DIV. 20
ARMY ENGINEER RESEARCH AND DEVELOPMENT LABS., FORT BELVOIR, VA.
DESCRIPTORS: (MEASUREMENT OF *RADIOLOGICAL CONTAMINATION FROM *PRESSURIZED WATER REACTRS IN VIRGINIA.) (RADIOACTIVE FALL-OUT, PRECIPITATION, POTOMAC RIVER, SEDIMENTATION, SOILS, FISHES, WATER.)

*PRIMARY BATTERIES

AD-271 180 62-2-2 DIV. 7
NATIONAL CARBON CO., INC., CLEVELAND, OHIO.
DESCRIPTORS: (FEASIBILITY STUDIES, *PRIMARY BATTERIES, *POWER SUPPLIES.) (PULSE HEIGHT ANALYZERS, SCINTILLATION COUNTERS, RADIOACTIVITY, SILVER COMPOUNDS, CHLORIDES, POTASSIUM COMPOUNDS, LITHIUM COMPOUNDS, CHLORIDES.) (*CATHODES (ELECTROLYTIC CELL), COPPER COMPOUNDS, SULFIDES, IRON COMPOUNDS, SULFIDES, DEGASIFICATION.)

*PRIMATES

AD-271 160 62-2-2 DIV. 16
TEXAS U. MEDICAL BRANCH, GALVESTON.
DESCRIPTORS: (*PRIMATES, *ELECTROCARDIOGRAPHY, PHYSIOLOGY, TEST METHODS.)

*PRINTED CIRCUITS

AD-271 035 62-2-2 DIV. 8
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*BIBLIOGRAPHY, *PRINTED CIRCUITS, MANUFACTURING METHODS.)

*PROBABILITY

AD-271 516 62-2-2 DIV. 19
BROWN U. DIV. OF APPLIED MATHEMATICS, PROVIDENCE, R. I.
DESCRIPTORS: (*PROBABILITY, STATISTICAL PROCESSES, THEORY.) (INEQUALITIES, *STATISTICAL ANALYSIS, STATISTICAL FUNCTIONS, *STATISTICAL DISTRIBUTIONS, SERIES, SEQUENCES, INTEGRAL EQUATIONS, MATRIX ALGEBRA, DIFFERENTIAL EQUATIONS, FUNCTIONS, SPECIAL FUNCTIONS, HARMONIC ANALYSIS.)

*PROGRAMMING

AD-271 370 62-2-2 DIV. 25
UPPSALA U. (SWEDEN).
DESCRIPTORS: (RADIOACTIVE DECAY, *ELECTRON TRANSITIONS, *QUANTUM MECHANICS, *PROGRAMMING, MATHEMATICAL ANALYSIS, LEAST SQUARES METHOD, POLYNOMIALS.)

AD-271 618 62-2-2 DIV. 30
RESEARCH ANALYSIS CORP., BETHESDA, MD.
DESCRIPTORS: (DIGITAL COMPUTERS, *PROGRAMMING.)

*PROJECTILES

AD-271 550 62-2-2 DIV. 22
GENERAL TECHNOLOGY CORP., ELGIN, ILL.
DESCRIPTORS: (*CYLINDRICAL BODIES, *EXPLOSIVES, *PROJECTILES, MECHANICAL PROPERTIES, STRESSES, *HIGH EXPLOSIVE AMMUNITION, DEFORMATION, DESIGN, TEST METHODS, DIGITAL COMPUTERS.) (CYLINDRICAL BODIES, STRESSES, MEASUREMENT, ROTATING BANDS.)

*PROPELLANT TANKS

AD-271 001 62-2-2 DIV. 10
NAVAL RESEARCH LAB., WASHINGTON, D. C.
DESCRIPTORS: (*FUEL STORAGE TANKS AND *PROPELLANT TANKS FOR LIQUID ROCKET PROPELLNTS AND ROCKET OXIDIZERS, STORAGE, HAZARDS, RELIABILITY.) (*PAINTS, COATINGS, *CHEMICAL INDICATORS.) NAVAL VESSELS.

*PROPELLANTS

AD-271 125 62-2-2 DIV. 10
STANFORD RESEARCH INST., MENLO PARK, CALIF.
DESCRIPTORS: (INHIBITION OF *COMBUSTION, FLAME PROPAGATION, *PROPELLANTS, HYDROCARBONS BY HALOGEN COMPOUNDS, METALS, BORDER METALS) (VAPORIZATION, SURFACE AREA, PARTICLES, ABSORPTION, SPECIFIC HEAT.) (PHOSPHORUS COMPOUNDS, SULFUR COMPOUNDS, BORON COMPOUNDS, FLUORIDES, BROMIDES, CHLORIDES, HALIDES, OXYCHLORIDES.) (CALCIUM COMPOUNDS, SODIUM COMPOUNDS, POTASSIUM COMPOUNDS, CARBONATES.) METHANES.

*PROTON BOMBARDMENT

AD-271 409 62-2-2 DIV. 20
PALMER PHYSICAL LAB., PRINCETON U., N. J.
DESCRIPTORS: (*PROTON BOMBARDMENT, PROTON BEAMS, *ALUMINUM, *BERYLLIUM, PARTICLES, MESONS, ANTIPROTONS, VELOCITY, MEASUREMENT, DEUTERONS, TRITONS.) SYNCHROTRONS.

*PSYCHOLOGY

AD-270 938 62-2-2 DIV. 28
GEORGIA U., ATHENS.
DESCRIPTORS: (*PSYCHOLOGY, *VISUAL PERCEPTION, BEHAVIOR, THEORY, *PSYCHOMETRICS, CONDITIONED REFLEX, LEARNING.) (MATRIX ALGEBRA, MATHEMATICAL PREDICTION, PROBABILITY.) (*DISPLAY SYSTEMS, TARGET RECOGNITION, INTELLIGIBILITY.)

AD-271 969 62-2-2 DIV. 28
RESEARCH CENTER FOR GROUP DYNAMICS, U. OF MICHIGAN, ANN ARBOR.
DESCRIPTORS: (*PSYCHOLOGY, PERCEPTION,

*AUDITORY PERCEPTION; CONDITIONED REFLEX; REACTION (PSYCHOLOGY); TRAINING; LEARNING; STIMULATION; INTENSITY; LABORATORY ANIMALS; PIGEONS.)

*PSYCHOMETRICS

AD-270 938 62-2-2 DIV. 20
GEORGIA U., ATHENS.
DESCRIPTORS: (*PSYCHOLOGY, *VISUAL PERCEPTION, BEHAVIOR; THEORY, *PSYCHOMETRICS; CONDITIONED REFLEX; LEARNING.) (MATRIX ALGEBRA; MATHEMATICAL PREDICTION; PROBABILITY.) (*DISPLAY SYSTEMS, TARGET RECOGNITION; INTELLIGIBILITY.)

*PURIFICATION

AD-271 105 62-2-2 DIV. 4
IONICS, INC., CAMBRIDGE, MASS.
DESCRIPTORS: (*ORGANIC COMPOUNDS; *HYDROCARBONS; LIQUIDS; *PURIFICATION, SEPARATION.) (MIXTURES; HEPTANES WITH PENTANES OR CYCLOHEXANES OR BENZENES CYCLOHEXENES; ETHERS.) (DENSITY; PRESSURE; PHYSICAL PROPERTIES; CHROMATOGRAPHIC ANALYSIS.) (SEMIPERMEABILITY; FILMS; MEMBRANES; POLYMERS; ETHYLENES OR PROPENES.)

*QUANTUM MECHANICS

AD-270 957 62-2-2 DIV. 25
INSTITUTE FOR MOLECULAR PHYSICS, U. OF MARYLAND, COLLEGE PARK.
DESCRIPTORS: (*QUANTUM MECHANICS; ELECTRON TRANSITIONS; MOLECULES; IONS; *HYDRIDES; *BERYLLIUM COMPOUNDS; *CARBON COMPOUNDS; METHANES; ENERGY; THEORY; MATHEMATICAL ANALYSIS.)

AD-271 029 62-2-2 DIV. 25
COLORADO U., BOULDER.
DESCRIPTORS: (*TABLES, *MICROWAVE SPECTROSCOPY; ROTATION; RESONANCE; FREQUENCY; CONTROL; MICROWAVES.) (ALGEBRA; THEORY; INTEGRAL EQUATIONS; MATRIX ALGEBRA; DIPOLE MOMENTS; *QUANTUM MECHANICS.)

AD-271 370 62-2-2 DIV. 25
UPPSALA U. (SWEDEN).
DESCRIPTORS: (RADIOACTIVE DECAY; *ELECTRON TRANSITIONS; *QUANTUM MECHANICS; *PROGRAMMING; MATHEMATICAL ANALYSIS; LEAST SQUARES METHOD; POLYNOMIALS.)

*QUANTUM STATISTICS

AD-271 181 62-2-2 DIV. 25
ILLINOIS U., URBANA.
DESCRIPTORS: (*SUPERCONDUCTORS, SUPERCONDUCTIVITY.) (*QUANTUM STATISTICS; CALCULUS OF VARIATIONS; MATRIX ALGEBRA.) (*ELECTROMAGNETIC THEORY; PARTICLES; ELECTRONS; PHONONS; EXCITATION; RELAXATION TIME; PARAMAGNETIC CRYSTALS.) (EQUATIONS OF ENERGY AND MOTION; HARMONIC ANALYSIS.) SOLID STATE PHYSICS; THESES.

*RADAR DUPLEXERS

AD-271 044 62-2-2 DIV. 8
BOMAC LABS., INC., BEVERLY, MASS.
DESCRIPTORS: (*RADAR DUPLEXERS; *SWITCHING CIRCUITS; *TRANSMIT-RECEIVE TUBES; *ELECTRONIC SWITCHES; SINGLE CRYSTALS; BROADBAND, X BAND; DESIGN.)

AD-271 400 62-2-2 DIV. 8
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
DESCRIPTORS: (*RADAR DUPLEXERS, X BAND; RADIOFREQUENCY POWER; MICROWAVE EQUIPMENT; MASERS, BROADBAND; SWITCHES; DESIGN; SIGNAL-TO-NOISE RATIO; NOISE (RADAR); STANDING WAVE RATIOS; EFFECTIVENESS; TESTS.)

*RADAR TRANSMITTERS

AD-271 584 62-2-2 DIV. 6
DIAMOND ORDNANCE FUZE LABS., WASHINGTON, D. C.
DESCRIPTORS: (*DIRECTION FINDING; POSITION FINDING; *RADAR TRANSMITTERS, RADAR INTERCEPTION; RADAR REFLECTIONS, RADAR PULSES, ANGLE OF ARRIVAL; PULSE ANALYZERS; THEORY, ERRORS; FEASIBILITY STUDIES.)

*RADIATION DAMAGE

AD-271 379 62-2-2 DIV. 20
NAVAL RESEARCH LAB., WASHINGTON, D. C.
DESCRIPTORS: (*NUCLEAR POWER PLANTS; MATERIALS; *STEEL; *RADIATION EFFECTS; *RADIATION DAMAGE; MECHANICAL PROPERTIES; STRESSES; TEMPERATURE.)

*RADIATION EFFECTS

AD-270 950 62-2-2 DIV. 25
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
DESCRIPTORS: (*THERMAL RADIATION; PRODUCTION; *RADIATION EFFECTS; MATERIALS; BIBLIOGRAPHY.) (SKIN; SIMULATION; TESTS.) LABORATORY EQUIPMENT.

AD-270 951 62-2-2 DIV. 14
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
DESCRIPTORS: (*RADIATION EFFECTS; *THERMAL RADIATION; SOURCES; MATERIALS; PAINTS; COATINGS; TEXTILES; PLASTICS; CERAMIC MATERIALS; ASPHALT; FUELS.) (*SKIN; SIMULATION; POLYMERS; ETHYLENES; BURNS; REFLECTION.) (TEST METHODS; TEST EQUIPMENT; INCANDESCENT LAMPS TUNGSTEN.)

AD-270 970 62-2-2 DIV. 16
BAYLOR U. COLL. OF MEDICINE, HOUSTON, TEX.
DESCRIPTORS: (*RADIATION EFFECTS; *METABOLISM; *IRON AND *HEMOPOIESIS.) (*CANCER; CELLS (BIOLOGY); BLOOD; BIOCHEMICAL TESTS; ENZYME, DETECTION; THERAPY.)

AD-271 036 62-2-2 DIV. 20
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*BIBLIOGRAPHY; *RADIATION EFFECTS; *SOLAR CELLS; GLASS.)

AD-271 351 62-2-2 DIV. 20
RADIATION EFFECTS INFORMATION CENTER, COLUMBUS, OHIO.
DESCRIPTORS: (CHEMISTRY; ELECTRONICS; POLYMERS; RADIATION DAMAGE; METALS; INORGANIC SUBSTANCES; ORGANIC COMPOUNDS; DOSIMETERS; *RADIATION EFFECTS; *BIBLIOGRAPHY.)

AD-271 379 62-2-2 DIV. 20
NAVAL RESEARCH LAB., WASHINGTON, D. C.
DESCRIPTORS: (*NUCLEAR POWER PLANTS; MATERIALS; *STEEL; *RADIATION EFFECTS; *RADIATION DAMAGE; MECHANICAL PROPERTIES; STRESSES; TEMPERATURE.)

AD-271 474 62-2-2 DIV. 16
WESTERN BIOLOGICAL LABS., CULVER CITY, CALIF.
DESCRIPTORS: (*RADIATION EFFECTS; *GAMMA RAYS; NUTRITION; *VITAMIN B.) (LABORATORY ANIMALS; GROWTH; LEARNING; SURVIVAL.)

*RADIATION HAZARDS

AD-271 117 62-2-2 DIV. 8
NAVAL ORDNANCE TEST STATION, CHINA LAKE, CALIF.
DESCRIPTORS: (*RADIOFREQUENCY FILTERS; *LOW-PASS FILTERS, SUPPRESSORS; *RADIATION HAZARDS; DESIGN.) (EXPLOSIONS; EXPLOSIVE ACTUATORS; *ORDNANCE; *SAFETY; ELECTRIC IGNITERS; FIRING CIRCUITS, ELECTROMAGNETIC FIELDS; ELECTRICAL NETWORKS; RADIO INTERFERENCE; REDUCTION.)

*RADIATION TOLERANCE

AD-271 171 62-2-2 DIV. 25
AERONUTRONIC, NEWPORT BEACH, CALIF.
DESCRIPTORS: (*CARBON DIOXIDE; *RADIATION TOLERANCE; TRANSMISSION; BEHAVIOR.) (*FLAMES; INTENSITY; ABSORPTION.) (STATISTICAL ANALYSIS; TABLES.)

*RADIO ASTRONOMY

AD-270 932 62-2-2 DIV. 2
RADIO OBSERVATORY, CALIF. INST. OF TECH., OWENS VALLEY, CALIF.
DESCRIPTORS: (*RADIO WAVES, *EXTRATERRESTRIAL RADIO WAVES; RADIO SIGNALS, SOURCES.) (*STARS; *GALAXIES; BRIGHTNESS; VISIBILITY, FOURIER ANALYSIS; SERIES.) *RADIO ASTRONOMY.

*RADIO COMMUNICATION SYSTEMS

AD-271 026 62-2-2 DIV. 5
SYLVANIA ELECTRIC PRODUCTS, INC., WALTHAM, MASS.
DESCRIPTORS: (*ANTENNAS; *ANTENNA RADIATION PATTERNS; *RADIO COMMUNICATION SYSTEMS; *RADIO SIGNALS; DESIGN.) (RADIO WAVES; ATMOSPHERE, SCATTERING; TRACKING; THEORY; MEASUREMENT; STATISTICAL ANALYSIS; EFFECTIVENESS; CONFIGURATION.) (MICROWAVES; RADIO TRANSMISSION; *RADIO RECEPTION; DIVERSITY SYSTEMS.)

AD-271 037 62-2-2 DIV. 5
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*RADIO COMMUNICATION SYSTEMS, COMMUNICATION SYSTEMS; MILITARY COMMUNICATIONS; AIR FORCE COMMUNICATIONS; RADIO RELAY SYSTEMS; *SATELLITE VEHICLES; AIRBORNE; *BIBLIOGRAPH.)

AD-271 111 62-2-2 DIV. 5
NATIONAL CASH REGISTER CO., DAYTON, OHIO.
DESCRIPTORS: (*COMMUNICATION SYSTEMS; *HIGH FREQUENCY; *RADIO COMMUNICATION SYSTEMS; *DIGITAL SYSTEMS; AIRBORNE; GROUND SUPPORT EQUIPMENT; DESIGN.) (DATA TRANSMISSION SYSTEMS; SYNCHRONIZERS; BAND-PASS FILTERS; RADIOFREQUENCY FILTERS; SIGNAL-TO-NOISE RATIO; PIEZOELECTRIC CRYSTALS; CRYSTAL FILTERS; AUTOMATIC VOLUME CONTROL.) (DIGITAL COMPUTERS; CIRCUITS; TRIGGER CIRCUITS; ELECTRONIC CIRCUITS; SYNTHESIS; TESTS; RELIABILITY.)

*RADIO RECEIVERS

AD-271 531 62-2-2 DIV. 6
ELECTRICAL ENGINEERING RESEARCH LAB., U. OF ILLINOIS, URBANA.
DESCRIPTORS: (*DIRECTION FINDING; MEDIUM FREQUENCY, HIGH FREQUENCY, VERY HIGH FREQUENCY; *RADIO RECEIVERS; ANTENNAS, DOPPLER SYSTEMS; RADIO EQUIPMENT; DESIGN; TESTS.) (RADIO WAVES; IONOSPHERIC PROPAGATION; PHASE MEASUREMENT.)

*RADIO RECEPTION

AD-271 026 62-2-2 DIV. 5
SYLVANIA ELECTRIC PRODUCTS, INC., WALTHAM, MASS.
DESCRIPTORS: (*ANTENNAS; *ANTENNA RADIATION PATTERNS; *RADIO COMMUNICATION SYSTEMS; *RADIO SIGNALS; DESIGN.) (RADIO WAVES; ATMOSPHERE, SCATTERING; TRACKING; THEORY; MEASUREMENT; STATISTICAL ANALYSIS; EFFECTIVENESS; CONFIGURATION.) (MICROWAVES; RADIO TRANSMISSION; *RADIO RECEPTION; DIVERSITY SYSTEMS.)

*RADIO SIGNALS

AD-271 026 62-2-2 DIV. 5
SYLVANIA ELECTRIC PRODUCTS, INC., WALTHAM, MASS.
DESCRIPTORS: (*ANTENNAS; *ANTENNA RADIATION PATTERNS; *RADIO COMMUNICATION SYSTEMS; *RADIO SIGNALS; DESIGN.) (RADIO WAVES; ATMOSPHERE, SCATTERING; TRACKING; THEORY; MEASUREMENT; STATISTICAL ANALYSIS; EFFECTIVENESS; CONFIGURATION.) (MICROWAVES; RADIO TRANSMISSION; *RADIO RECEPTION; DIVERSITY SYSTEMS.)

*RADIO SONO BUOYS

AD-271 074 62-2-2 DIV. 8
ANTI-SUBMARINE WARFARE LAB., NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA.
DESCRIPTORS: (*DIODES; *TRANSISTORS; PREAMPLIFIERS; *RADIO RECEIVERS; *TRANSISTOR AMPLIFIERS; SEMICONDUCTORS; AMPLITUDE MODULATION; FREQUENCY MODULATION; AIRBORNE; VERY HIGH FREQUENCY; *RADIO SONO BUOYS; THEORY; DESIGN.) (CIRCUITS; ELECTRONIC CIRCUITS; AMPLIFIERS.)

*RADIO WAVES

AD-270 932 62-2-2 DIV. 2
RADIO OBSERVATORY, CALIF. INST. OF TECH., OWENS VALLEY, CALIF.
DESCRIPTORS: (*RADIO WAVES, *EXTRATERRESTRIAL RADIO WAVES; RADIO SIGNALS, SOURCES.) (*STARS; *GALAXIES; BRIGHTNESS; VISIBILITY, FOURIER ANALYSIS; SERIES.) *RADIO ASTRONOMY.

AD-271 411 62-2-2 DIV. 5
ELECTRICAL ENGINEERING RESEARCH LAB., U. OF TEXAS, AUSTIN.
DESCRIPTORS: (*RADIO WAVES; ATMOSPHERE; *WAVE TRANSMISSION; PROPAGATION; SCATTERING, REFRACTIVE INDEX; THEORY; MATHEMATICAL ANALYSIS.) (REFRACTOMETERS; ANALOG COMPUTERS; TELEMETERING DATA.)

*RADIOFREQUENCY FILTERS

AD-271 107 62-2-2 DIV. 8
JOHNS HOPKINS U. SCHOOL OF ENGINEERING, BALTIMORE, MD.
DESCRIPTORS: (*INFORMATION THEORY; *RADIOFREQUENCY FILTERS; RADIO SIGNALS; CIRCUITS; ELECTRICAL NETWORKS.) (VECTOR ANALYSIS; APPLIED MATHEMATICS; SERIES; TRANSFORMATION (MATHEMATICS).)

AD-271 117 62-2-2 DIV. 8
NAVAL ORDNANCE TEST STATION, CHINA LAKE, CALIF.
DESCRIPTORS: (*RADIOFREQUENCY FILTERS; *LOW-PASS FILTERS, SUPPRESSORS; *RADIATION HAZARDS; DESIGN.) (EXPLOSIONS; EXPLOSIVE ACTUATORS; *ORDNANCE; *SAFETY; ELECTRIC IGNITERS; FIRING CIRCUITS, ELECTROMAGNETIC FIELDS; ELECTRICAL NETWORKS; RADIO INTERFERENCE; REDUCTION.)

AD-271 630 62-2-2 DIV. 25
SPERRY MICROWAVE ELECTRONICS CO., CLEARWATER, FLA.
DESCRIPTORS: (FERROMAGNETISM; FERROMAGNETIC MATERIALS; NONLINEAR SYSTEMS; *HARMONIC OSCILLATORS; *RADIOFREQUENCY FILTERS.) (FERRITES; GARNET; BAND-PASS FILTERS; ELECTRONICS; *SOLID STATE PHYSICS.)

*RADIOGRAPHY

AD-271 589 62-2-2 DIV. 14
NATIONAL CARBON CO., INC., CLEVELAND, OHIO.
DESCRIPTORS: (*GRAPHITE; *X RAYS; *RADIOGRAPHY; SENSITIVITY; CHEMICAL IMPURITIES; DISTRIBUTION.) (X RAYS; DETECTORS; FLUORESCENT SCREENS; PHOTOGRAPHIC FILM; IONIZATION CHAMBERS; SHEETS; ALUMINUM; SELENIUM; COATINGS.)

*RADIOLOGICAL CONTAMINATION

AD-271 023 62-2-2 DIV. 20
ARMY ENGINEER RESEARCH AND DEVELOPMENT LABS., FORT BELVOIR, VA.
DESCRIPTORS: (MEASUREMENT OF *RADIOLOGICAL CONTAMINATION FROM *PRESSURIZED WATER REACTRS IN VIRGINIA.) (RADIOACTIVE FALL-OUT; PRECIPITATION; POTOMAC RIVER; SEDIMENTATION; SOILS; FISHES; WATER.)

*RADIOMETERS

AD-271 062 62-2-2 DIV. 6
ANTENNA LAB., OHIO STATE U. RESEARCH FUNDATION, COLUMBUS.
DESCRIPTORS: (*AERIAL RECONNAISSANCE; *EXTRA TERRESTRIAL BASES; *RADIOMETERS; THERMAL TARGETS; THERMAL RADIATION; MICROWAVES; TERRAIN; WAVE TRANSMISSION; REFLECTION; DETECTION; SCATTERING; ATTENUATION; MILITARY INTELLIGENCE; FEASIBILITY STUDIES.) (ANTIRADAR COATINGS;

RADAR ECHO AREAS; TEMPERATURE; RADAR TARGET; MEASUREMENT.)

*RADOMES

AD-271 167 62-2-2 DIV. 1
BOEING CO., WICHITA, KANS.
DESCRIPTORS: (*AIRFRAMES; *RADOMES; *MATERIALS; METALS; ALLOYS; STAINLESS STEEL; CHEMICAL MILLING; PLATING; ALUMINUM; MANGANESE; CADMIUM PLATING; POLYMERS; HEAT RESISTANT POLYMERS; PLASTICS; ADHESIVES; RESIN ADHESIVES; ENAMEL COATINGS; VARNISHES; ORGANIC COATINGS; LAMINATES; TEXTILES; LUBRICANTS;) (METAL JOINTS; TITANIUM;) (BONDING; BRAZING; CERAMIC MATERIALS;) (JET FUELS; IGNITION;) (HIGH TEMPERATURE RESEARCH; MACHINING;)

AD-271 567 62-2-2 DIV. 8
PLASTICS RESEARCH LAB., MASS. INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*RADOMES; MATERIALS; BRITTLE MATERIALS; *EXPANDED PLASTICS; POLYMERS; *URETHANES;) (DENSITY; TENSILE PROPERTIES; MECHANICAL PROPERTIES; PRODUCTION; QUALITY CONTROL; FAILURE (MECHANICS); FRACTURE (MECHANICS); WELDED JOINTS; BONDED JOINTS; DESIGN; RELIABILITY;) (TESTS; TEST METHODS;)

*RAINDROPS

AD-271 098 62-2-2 DIV. 2
ILLINOIS STATE WATER SURVEY, URBANA.
DESCRIPTORS: (*RAINDROPS, MEASUREMENT; PHOTOGRAPHIC ANALYSIS; INSTRUMENTATION;) (RAINDROPS; *ELECTROSTATIC FIELDS;) (RAINDROPS; STABILITY;) (PRECIPITATION; METEOROLOGICAL RADAR;)

*RANGE

AD-271 090 62-2-2 DIV. 30
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*RANGE; SIMULATION; *OPTICAL EQUIPMENT;) (BINOCULARS; TELESCOPES; TEST EQUIPMENT;) *COLLIMATORS.

*RARE EARTH COMPOUNDS

AD-271 358 62-2-2 DIV. 7
SPECTROLAB, INC., NORTH HOLLYWOOD, CALIF.
DESCRIPTORS: (SATELLITE VEHICLES; POWER SUPPLIES; SILICON; *SOLAR CELLS; *OPTICAL COATINGS; *INFRARED FILTERS; THEORY;) (TESTS; THERMODYNAMICS; WAVE TRANSMISSION; REFLECTION; BLACKBODY RADIATION; SPACE ENVIRONMENTAL CONDITIONS; STABILITY; RADIATION EFFECTS; BETA PARTICLES; INFRARED RADIATION;) (RARE EART, *RARE EARTH COMPOUNDS; FLUORIDES; OXYFLUORIDES;) (COATINGS; VAPOR PLATING;) (RESIN ADHESIVES; BONDING;)

AD-271 582 62-2-2 DIV. 17
RESEARCH CHEMICALS, INC., BURBANK, CALIF.
DESCRIPTORS: (PHASE STUDIES; *YTTRIUM; *RARE EARTHS; *OXYGEN; SOLUBILITY; ERBIUM; NEODYMIUM; SAMARIUM; EUTECTICS; INTERMETALLIC COMPOUNDS; PHASE TRANSITIONS; METALLURGICAL ANALYSIS; GRAINS (METALLURGY); MECHANICAL PROPERTIES; TENSILE PROPERTIES; MICROSTRUCTURE;) (ALLOYS; METALS; PREPARATION; PURIFICATION; CORROSION RESEARCH;) (COBALT ALLOYS; NICKEL ALLOYS; TANTALUM ALLOYS; NIOBIUM ALLOYS; ZIRCONIUM ALLOYS; BERYLLIUM ALLOYS;) *RARE EARTH COMPOUNDS; *RARE EARTH ELEMENTS.

AD-271 587 62-2-2 DIV. 25
NAVAL ORDNANCE LAB., CORONA, CALIF.
DESCRIPTORS: (*TELEPHONE COMMUNICATION SYSTEMS; PANEL BOARDS (ELECTRICITY); NOISE GENERATORS; THEORY; DESIGN;) (*FERROMAGNETSM; *IRON ALLOYS; *NICKEL ALLOYS; FILMS;) (*RARE GASES; INFRARED SPECTROSCOPY, INTERFEROMETERS; ELECTROMAGNETIC WAVES; WAVE TRANSMISSION;) (*SEMICONDUCTORS; *SILICON; MAGNETO-OPTIC ACTATION;) (*HEAT RESISTANT POLYMERS; *POLYMERS; *PHOSPHINES; PHENYL RADICALS; CHLORIDES; SYNTHESIS; CHEMICAL REACTIONS;) (SOLID STATE PHYSICS; *MICROWAVE OSCILLATORS; *DIODES; *RARE EARTH COMPOUNDS; CALCIUM COMPOUNDS; FLUORIDES; *THULIM COMPOUNDS; SPECTROPHOTOMETERS; ABSORPTION; FLUORESCENCE; CRYSTALS;) (*GUIDED MISSILE ANTENNAS; *SLOT ANTENNAS; *WAVEGUIDE SLOTS; DIELECTRICS; ANTENNA RADITION PATTERNS; MEASUREMENT;)

*RARE EARTH ELEMENTS

AD-271 582 62-2-2 DIV. 17
RESEARCH CHEMICALS, INC., BURBANK, CALIF.
DESCRIPTORS: (PHASE STUDIES; *YTTRIUM; *RARE EARTHS; *OXYGEN; SOLUBILITY; ERBIUM; NEODYMIUM; SAMARIUM; EUTECTICS; INTERMETALLIC COMPOUNDS; PHASE TRANSITIONS; METALLURGICAL ANALYSIS; GRAINS (METALLURGY); MECHANICAL PROPERTIES; TENSILE PROPERTIES; MICROSTRUCTURE;) (ALLOYS; METALS; PREPARATION; PURIFICATION; CORROSION RESEARCH;) (COBALT ALLOYS; NICKEL ALLOYS; TANTALUM ALLOYS; NIOBIUM ALLOYS; ZIRCONIUM ALLOYS; BERYLLIUM ALLOYS;) *RARE EARTH COMPOUNDS; *RARE EARTH ELEMENTS.

*RARE EARTHS

AD-271 582 62-2-2 DIV. 17
RESEARCH CHEMICALS, INC., BURBANK, CALIF.
DESCRIPTORS: (PHASE STUDIES; *YTTRIUM; *RARE EARTHS; *OXYGEN; SOLUBILITY; ERBIUM; NEODYMIUM; SAMARIUM; EUTECTICS; INTERMETALLIC COMPOUNDS; PHASE TRANSITIONS; METALLURGICAL ANALYSIS; GRAINS (METALLURGY); MECHANICAL PROPERTIES; TENSILE PROPERTIES; MICROSTRUCTURE;) (ALLOYS; METALS; PREPARATION; PURIFICATION; CORROSION RESEARCH;) (COBALT ALLOYS; NICKEL ALLOYS; TANTALUM ALLOYS; NIOBIUM ALLOYS; ZIRCONIUM ALLOYS; BERYLLIUM ALLOYS;) *RARE EARTH COMPOUNDS; *RARE EARTH ELEMENTS.

*RARE GASES

AD-271 587 62-2-2 DIV. 25
NAVAL ORDNANCE LAB., CORONA, CALIF.
DESCRIPTORS: (*TELEPHONE COMMUNICATION SYSTEMS; PANEL BOARDS (ELECTRICITY); NOISE GENERATORS; THEORY; DESIGN;) (*FERROMAGNETSM; *IRON ALLOYS; *NICKEL ALLOYS; FILMS;) (*RARE GASES; INFRARED SPECTROSCOPY, INTERFEROMETERS; ELECTROMAGNETIC WAVES; WAVE TRANSMISSION;) (*SEMICONDUCTORS; *SILICON; MAGNETO-OPTIC RCTATION;) (*HEAT RESISTANT POLYMERS; *POLYMERS; *PHOSPHINES; PHENYL RADICALS; CHLORIDES; SYNTHESIS; CHEMICAL REACTIONS;) (SOLID STATE PHYSICS; *MICROWAVE OSCILLATORS; *DIODES; *RARE EARTH COMPOUNDS; CALCIUM COMPOUNDS; FLUORIDES; *THULIM COMPOUNDS; SPECTROPHOTOMETERS; ABSORPTION; FLUORESCENCE; CRYSTALS;) (*GUIDED MISSILE ANTENNAS; *SLOT ANTENNAS; *WAVEGUIDE SLOTS; DIELECTRICS; ANTENNA RADITION PATTERNS; MEASUREMENT;)

*REACTOR KINETICS

AD-271 360 62-2-2 DIV. 10
TEXACO EXPERIMENT, INC., RICHMOND, VA.
DESCRIPTORS: (*RECOMBINATION REACTIONS; *REACTION KINETICS; *IONS; *FLAMES; COMBUSTION;) (CHEMICAL REACTIONS; TEMPERATURE; PRESSURE; GASES; TESTS; THEORY;) (HYDROXIDES; TRITIUM OXIDE; IONS;) (METHANES; PROPANES; ACETYLENES; CHLORINE;)

*READING MACHINES

AD-271 548 62-2-2 DIV. 30
FARRINGTON ELECTRONICS, INC., ALEXANDRIA, VA.
DESCRIPTORS: (*READING MACHINES; OPTICAL EQUIPMENT; *COMMUNICATION SYSTEMS; TELETYPE SYSTEMS; DATA TRANSMISSION SYSTEMS; EFFECTIVENESS; ERRORS; DESIGN; TESTS; ANALYSIS;)

*RECOIL MECHANISMS

AD-271 353 62-2-2 DIV. 22
ROCK ISLAND ARSENAL LAB., ILL.
DESCRIPTORS: (*GUNS; *ARTILLERY; *SPOTTING RIFLES; *RECOIL MECHANISMS; FEASIBILITY STUDIES; MATHEMATICAL ANALYSIS; DESIGN; TESTS;)

*RECOMBINATION REACTIONS

AD-271 360 62-2-2 DIV. 10
TEXACO EXPERIMENT, INC., RICHMOND, VA.
DESCRIPTORS: (*RECOMBINATION REACTIONS; *REACTION KINETICS; *IONS; *FLAMES; COMBUSTION;) (CHEMICAL REACTIONS; TEMPERATURE, PRESSURE; GASES; TESTS; THEORY;) (HYDROXIDES; TRITIUM OXIDE; IONS;) (METHANES; PROPANES; ACETYLENES; CHLORINE;)

AD-271 563 62-2-2 DIV. 30
LUND U. (SWEDEN).
DESCRIPTORS: (*PHOTOLYSIS; ORGANIC SOLVENTS; METHYL RADICALS; PENTANES; CARBON COMPOUNDS, SULFIDES; ETHYL RADICALS; IODIDES;) (*SPECTROPHOTOMETERS; DESIGN; LOW TEMPERATURE RESEARCH; *THERMOCHEMISTRY; *CHEMICAL BONDS; *RECOMBIATION REACTIONS; *FREE RADICALS;) SWEDEN.

*RECORDS

AD-271 585 62-2-2 DIV. 33
CALIFORNIA U., LOS ANGELES.
DESCRIPTORS: (*CARGO; *HANDLING; *RECORDS; STATISTICAL ANALYSIS;) (DATA PROCESSING SYSTEM; DIGITAL COMPUTERS;)

*RECOVERY VEHICLES

AD-271 610 62-2-2 DIV. 11
CONTINENTAL ARMY COMMAND, FORT MONROE, VA.
DESCRIPTORS: (MOBILE; *RECOVERY VEHICLES; *CARGO VEHICLES; DESIGN; FEASIBILITY STUDIES FOR MILITARY OPERATIONS AND ARMY OPERATIONS;) (*VEHICLES; AIR TRANSPORTATION; RAILROADS; MAINTENANCE VEHICLES; MAINTENANCE TOOLS; MILITARY TRANSPORTATION; TRACKED VEHICLES; MAINTENANCE;)

*RECRUITING

AD-271 149 62-2-2 DIV. 28
EDUCATIONAL TESTING SERVICE, PRINCETON, N. J.
DESCRIPTORS: (*INDUSTRIAL PSYCHOLOGY; *MILITARY PSYCHOLOGY; *RECRUITING; MILITARY PERSONNEL; PSYCHOMETRICS; MATHEMATICAL ANALYSIS; COMBINATORIAL ANALYSIS; EFFECTIVENESS;)

*RE-ENTRY AERODYNAMICS

AD-271 529 62-2-2 DIV. 9
AERONAUTICAL SYSTEMS DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: *SYMPOSIA; AIRFRAMES; STRUCTURES; *AERODYNAMIC HEATING; THERMODYNAMICS; DYNAMICS; AERODYNAMICS; *RE-ENTRY AERODYNAMICS; ELASTICITY; STABILITY; FLUTTER; LOAD DISTRIBUTION; HYPERSONICS; THERMAL STRESSES; HEAT TRANSFER; RE-ENTRY VEHICLES.

AD-271 575 62-2-2 DIV. 9
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*RE-ENTRY VEHICLES; *HYPERVELOCITY VEHICLES; AERODYNAMIC CONFIGURATIONS; TRIANGULAR WINGS; *WIND TUNNEL MODELS; MODEL TESTS; AERODYNAMICS; *RE-ENTRY AERODYNAMICS; STABILITY; CONTROL; STABILITY (LATERAL); STABILITY (LONGITUDINAL); ROLL; DAMPING;)

*RE-ENTRY VEHICLES

AD-271 112 62-2-2 DIV. 12
NAVAL ORDNANCE LAB., WHITE OAK, MD.
DESCRIPTORS: (HIGH TEMPERATURE RESEARCH; TEST EQUIPMENT; TEST METHODS; *THERMAL INSULATION; HEAT; *INSULATING MATERIALS; HEAT RESISTANT POLYMERS; REFRACTORY MATERIALS; *ABLATION; *GUIDED MISSILES; *RE-ENTRY VEHICLES; *ROCKET CASES; *ROCKET MOTOR NOZZLES;) (MEASUREMENT; TEMPERATURE; THERMAL DIFFUSION; MATHEMATICAL ANALYSIS;) (OXYGEN; ACETYLENES; WELDING; FLAMES;)

AD-271 575 62-2-2 DIV. 9
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*RE-ENTRY VEHICLES; *HYPERVELOCITY VEHICLES; AERODYNAMIC CONFIGURATIONS; TRIANGULAR WINGS; WIND TUNNEL MODELS; MODEL TESTS; AERODYNAMICS; *RE-ENTRY AERODYNAMICS; STABILITY; CONTROL; STABILITY (LATERAL); STABILITY (LONGITUDINAL); ROLL; DAMPING;)

*REFRACTORY COATINGS

AD-271 166 62-2-2 DIV. 1
BOEING CO., WICHITA, KANSAS.
DESCRIPTORS: (*AIRFRAMES; *MATERIALS; *METALS; *ALLOYS; TITANIUM ALLOYS; EXTRUSION; *CERAMIC COATINGS; *REFRACTORY COATINGS; FLAME SPRAYING; SEALING COMPOUNDS; ELASTOMERS; *PLASTICS; EXPANDED PLASTICS; *ADHESIVES; RESIN ADHESIVES; SANDWICH CONSTRUCTION; HONEYCOMB CORES; LAMINATES; HOSES;) (MECHANICAL PROPERTIES; TENSILE PROPERTIES; CLIMATIC FACTORS; FAILURE (MECHANICS); HIGH TEMPERATURE RESEARCH;) (POLYMERS; FLUORIDES; FLUOROCARBONS; SILICONES; SILANES; URETHANES; PYRIMIDINES;)

*REFRACTORY MATERIALS

AD-271 030 62-2-2 DIV. 17
DEFENSE METALS INFORMATION CENTER, COLUMBUS, OHIO.
DESCRIPTORS: (*REFRACTORY MATERIALS; *FORGING; MOLYBDENUM; MOLYBDENUM ALLOYS; TUNGSTEN; TUNGSTEN ALLOYS; TANTALUM; TANTALUM ALLOYS; NIOBIUM; NIOBIUM ALLOYS;) PREPARATION; POWDER METALLURGY; METAL FORMING PRESSES; FORGE PRESSES; HEATING; DIES; LUBRICANTS; DESIGN; MECHANICAL PROPERTIES.

AD-271 176 62-2-2 DIV. 14
GENERAL DYNAMICS/ASTRONAUTICS, SAN DIEGO, CALIF.
DESCRIPTORS: (*HIGH TEMPERATURE RESEARCH; NIOBIUM ALLOYS; *ALLOYS; *REFRACTORY MATERIALS; REFRACTORY COATINGS;) (*LOW TEMPERATURE RESEARCH; *ADHESIVES; METALS; THERMAL INSULATION; ALLOYS; STAINLESS STEEL; AUSTENITE;) (MECHANICAL PROPERTIES; DEFORMATION; PLASTICITY; NUCLEAR REACTIONS; RADIATION EFFECTS;) (*PLASTICS; *FLUOROCARBONS; CERAMIC MATERIALS;)

AD-271 377 62-2-2 DIV. 26
AEROPROJECTS, INC., WEST CHESTER, PA.
DESCRIPTORS: (*REFRACTORY MATERIALS; *HEAT RESISTANT ALLOYS; *ULTRASONICS; *WELDING; SHEETS;) (MOLYBDENUM ALLOYS, TITANIUM ALLOYS; NIOBIUM; TUNGSTEN; ALUMINUM; STANDING WAVE RATIOS; FOILS; TITANIUM; TANTALUM;) (WELDS; MECHANICAL PROPERTIES; TENSILE PROPERTIES; SHEAR STRESSES; DEFORMATION; FRACTURE (MECHANICS);)

AD-271 384 62-2-2 DIV. 14
DEFENSE METALS INFORMATION CENTER, COLUMBUS, OHIO.
DESCRIPTORS: (HIGH TEMPERATURE RESEARCH; *CERAMIC COATINGS AS *OXIDATION INHIBITORS FOR *REFRACTORY MATERIALS; *HEAT RESISTANT ALLOYS; METALS; MOLYBDENUM; MOLYBDENUM ALLOYS; NIOBIUM ALLOYS; TANTALUM ALLOYS; TUNGSTEN ALLOYS; VANADIUM ALLOYS;) (COATINGS OF SILICIDES, ALUMINUM COMPOUNDS, OXIDES; CERMETS; INTERMETALLIC COMPOUNDS; METAL COATINGS; BERYLLIUM COMPOUNDS;) (PROCESSING BY ELECTRODEPOSITION; CHEMICAL REACTIONS; DIFFUSION; FLAME SPRAYING;) (RE-ENTRY VEHICLES; SATELLITES; SPACESHIPS; GLIDERS; STRUCTURES; TURBOJET ENGINES; RAMJET ENGINES; ROCKET MOTORS; NUCLEAR PROPULSION;)

AD-271 536 62-2-2 DIV. 26
DOUGLAS AIRCRAFT CO., INC., LONG BEACH, CALIF.
DESCRIPTORS: (*ALLOYS; AND *METALS FOR AIRCRAFT; MATERIALS AND STRUCTURES; PRODUCTION BY *CHEMICAL MILLING; GELS; CARBOXYMETHYLCELLULOSE; POROUS MATERIALS; SOLIDS; SOLUTIONS CHEMICALS;) (PROCESSING; STEEL; STAINLESS STEEL; NICKEL ALLOYS; TITANIUM ALLOYS; VANADIUM ALLOYS; CHROMIUM ALLOYS; ALUMINUM ALLOYS; *REFRACTORY MATERIALS; HEAT RESISTANT ALLOYS; MOLYBDENUM ALLOYS; TITANIUM ALLOYS; TANTALUM; NIOBIUM;)

*RELAXATION TIME

AD-271 559 62-2-2 DIV. 25
RADIATION LAB., JOHNS HOPKINS U., BALTIMORE, MD.
DESCRIPTORS: (*PARAMAGNETIC CRYSTALS; PARA-

MAGNETIC SALTS; *POTASSIUM COMPOUNDS; COBALT COMPOUNDS; *IRON COMPOUNDS; *CYANIDES; *RELAXATION TIME; NUCLEAR SPINS; TEMPERATURE; LOW TEMPERATURE RESEARCH; SPECTROGRAPHIC ANALYSIS; *PARAMAGNETIC RESONANCE; THEORY.) MASERS.

*RELIABILITY

AD-271 367 62-2-2 DIV. 8
SYLVANIA ELECTRIC PRODUCTS, INC., WALTHAM, MASS.
DESCRIPTORS: (*RELIABILITY; DETERMINATION; *ELECTRONIC SYSTEMS; ELECTRONIC EQUIPMENT.) (STATISTICAL ANALYSIS; NUMERICAL METHODS AND PROCEDURES; *MATHEMATICAL PREDICTION; FAILURE (MECHANICS); TIME; MEASUREMENT.)

*REMOTE CONTROL SYSTEMS

AD-271 066 62-2-2 DIV. 28
BEHAVIORAL SCIENCES LAB., AEROSPACE MEDICAL DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: (*HUMAN ENGINEERING; SPACE FLIGHT.) (*SPACESHIPS; *SATELLITE VEHICLES; *MAINTENANCE; MAINTENANCE PERSONNEL; SENSORY PERCEPTION; *WEIGHTLESSNESS; VISUAL ACUITY; MOTOR REACTIONS; POSITIONING REACTIONS.) (*REMOTE CONTROL SYSTEMS; TEST EQUIPMENT; DESIGN.)

*RESISTORS

AD-271 050 62-2-2 DIV. 8
TEXAS INSTRUMENTS, INC., DALLAS.
DESCRIPTORS: (*RESISTORS; *SEMICONDUCTORS; MATERIALS; SILICON; TITANIUM COMPOUNDS; DIOXIDES; SILICON COMPOUNDS; GALLIUM COMPOUNDS; ARSENIDES; LEAD COMPOUNDS; TELLURIDES; INDIUM COMPOUNDS; ANTIMONIDES; SELENIUM COMPOUNDS; CRYSTALS; SINGLE CRYSTALS; CARBIDES; BORIDE; CHEMICAL IMPURITIES.)

*RESONANCE ABSORPTION

AD-271 615 62-2-2 DIV. 8
GOETTINGEN U. (GERMANY).
DESCRIPTORS: (ELECTROMAGNETIC WAVES; *ELECTROMAGNETIC WAVE REFLECTIONS; *MICROWAVES; REFLECTION; EXTREMELY HIGH FREQUENCY; ABSORPTION; MATERIALS.) (MICROWAVES; *RESONANCE ABSORPTION; DIPOLE ANTENNAS.) PROPAGATION.

*RESPIRATORS

AD-271 554 62-2-2 DIV. 16
HEALTH RESEARCH, INC., BUFFALO, N. Y.
DESCRIPTORS: (*RESPIRATORS; *ARTIFICIAL RESPIRATION; SIMULATION; TEST EQUIPMENT; DESIGN.) (*ANOXIA; ANESTHESIA; RESPIRATION; TRAINING; TRAINING DEVICES.)

*RETINA

AD-271 403 62-2-2 DIV. 16
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
DESCRIPTORS: (OPHTHALMOLOGY; *OPTICAL INSTRUMENTS; RETINOSCOPES.) (LABORATORY EQUIPMENT; RADIATION INJURIES; BURNS; *RETINA.)

*REYNOLDS NUMBER

AD-271 607 62-2-2 DIV. 9
BOEING SCIENTIFIC RESEARCH LABS., SEATTLE, WASH.
DESCRIPTORS: (*FLUID FLOW; ELASTICITY; STABILITY; TENSILE PROPERTIES; DAMPING.) (*INTEGRAL EQUATIONS; *REYNOLDS NUMBER.)

*RING WINGS

AD-271 568 62-2-2 DIV. 9
MISSISSIPPI U., UNIVERSITY.
DESCRIPTORS: (BODIES OF REVOLUTION; CONICAL BODIES; CONVEX BODIES; AIRFOILS; *RING WINGS; LAMINAR BOUNDARY LAYER; *TURBULENT BOUNDARY LAYER; SEPARATION; *TURBULENT FLOW; PRESSURE; MATHEMATICAL ANALYSIS.)

*ROCKET CASES

AD-271 065 62-2-2 DIV. 27
BUDD CO., PHILADELPHIA, PA.
DESCRIPTORS: (SOLID ROCKET PROPELLANTS; ROCKET MOTORS; *ROCKET CASES; MATERIALS; ALLOYS; DESIGN; MANUFACTURING METHODS; WELDING; WELDED JOINTS.) (STAINLESS STEEL; STEELS WITH NICKEL ALLOYS; TITANIUM ALLOYS; VANADIUM ALLOYS; ALUMINUM ALLOYS; CHROMIUM ALLOYS.) (HEAT TREATMENT; AGING.) (MECHANICAL PROPERTIES; TENSILE PROPERTIES; FRACTURE (MECHANICS); TESTS.) (CYLINDRICAL BODIES; STRESSES; MATHEMATICAL ANALYSIS.)

AD-271 112 62-2-2 DIV. 12
NAVAL ORDNANCE LAB., WHITE OAK, MD.
DESCRIPTORS: (HIGH TEMPERATURE RESEARCH; TEST EQUIPMENT; TEST METHODS; *THERMAL INSULATION; HEAT; *INSULATING MATERIALS; HEAT RESISTANT POLYMERS; REFRACTORY MATERIALS; *ABLATION; *GUIDED MISSILES; *RE-ENTRY VEHICLES; *ROCKET CASES; *ROCKET MOTOR NOZZLES.) (MEASUREMENT; TEMPERATURE; THERMAL DIFFUSION; MATHEMATICAL ANALYSIS.) (OXYGEN; ACETYLENES; WELDING; FLAMES.)

AD-271 152 62-2-2 DIV. 12
KIDDE, WALTER, AND CO., INC., BELLEVUE, N. J.
DESCRIPTORS: (*GUIDED MISSILES; UNDERWATER TO SURFACE; ROCKET MOTORS; *ROCKET CASES; GLASS TEXTILES; FILAMENT-WOUND CONSTRUCTION; HYDROSTATIC PRESSURE; STRESSES; TESTS; MODE TESTS.)

*ROCKET MOTOR NOZZLES

AD-271 112 62-2-2 DIV. 12
NAVAL ORDNANCE LAB., WHITE OAK, MD.
DESCRIPTORS: (HIGH TEMPERATURE RESEARCH; TEST EQUIPMENT; TEST METHODS; *THERMAL INSULATION; HEAT; *INSULATING MATERIALS; HEAT RESISTANT POLYMERS; REFRACTORY MATERIALS; *ABLATION; *GUIDED MISSILES; *RE-ENTRY VEHICLES; *ROCKET CASES; *ROCKET MOTOR NOZZLES.) (MEASUREMENT; TEMPERATURE; THERMAL DIFFUSION; MATHEMATICAL ANALYSIS.) (OXYGEN; ACETYLENES; WELDING; FLAMES.)

AD-271 375 62-2-2 DIV. 10
APPLIED PHYSICS LAB., JOHNS HOPKINS U., SILVER SPRING, MD.
DESCRIPTORS: (ROCKET MOTORS; *SOLID ROCKET PROPELLANTS; COMBUSTION; COMBUSTION CHAMBER GASES; EXHAUST GASES; EXHAUST FLAMES; THERMAL CONDUCTIVITY; REACTION KINETICS; CHEMICAL REACTIONS; DISSOCIATION; CONDENSATION REACTIONS; RECOMBINATION REACTIONS; TESTS.) (*ROCKET MOTOR NOZZLES; FLAMES; GAS FLOW; BOUNDARY LAYER; LAMINAR BOUNDARY LAYER; TURBULENT BOUNDARY LAYER; HEAT TRANSFER; THERMODYNAMICS.) (TEST METHODS; TEST EQUIPMENT.)

AD-271 436 62-2-2 DIV. 27
ROLLA METALLURGY RESEARCH CENTER, BUREAU OF MINES, MO.
DESCRIPTORS: (*ROCKET MOTOR NOZZLES; COATINGS; *VAPOR PLATING; *TUNGSTEN; TUNGSTEN COMPOUNDS; BERYLLIUM COMPOUNDS; OXIDES; CRYSTALLIZATION.)

*ROCKET MOTORS

AD-271 146 62-2-2 DIV. 12
ILLINOIS U., URBANA.
DESCRIPTORS: (SPIN; *MOTION; ROTATION; EQUATIONS.) (GUIDED MISSILE TRAJECTORIES; *ROCKET MOTORS; FUEL CELLS.) (DYNAMICS; BALLISTICS; GUIDED MISSILES.) *STABILIZATION SYSTEMS.

AD-271 193 62-2-2 DIV. 12
OGDEN AIR MATERIAL AREA, HILL AIR FORCE BASE, UTAH.
DESCRIPTORS: (*GUIDED MISSILES; AIR TO AIR; *ROCKET MOTORS; SHIPPING; *CONTAINERS; IMPACT SHOCK; TESTS; HANDLING; PRESSURE.)

*ROCKET OXIDIZERS

AD-270 929 62-2-2 DIV. 10
ATLANTIC RESEARCH CORP., ALEXANDRIA, VA.
DESCRIPTORS: (*SOLID ROCKET PROPELLANTS; *ROCKET OXIDIZERS; *COMBUSTION; IGNITION; REACTION KINETICS; FLAMES; FLAME PROPAGATION; PRESSURE; THEORY; DECOMPOSITION; THERMOCHEMISTRY.) (*PERCHLORIC ACIDS; VAPORS; CHEMICAL REACTIONS; AMMONIA.) (AMMONIUM RADICALS; POTASSIUM COMPOUNDS; *PERCHLORATES AND METHANES; MIXTURES OF BINDERS; POLYMERS; VINYLCHLORIDES; CARBOXYLIC ACIDS.)

AD-270 941 62-2-2 DIV. 10
RESEARCH INST., TEMPLE U., PHILADELPHIA, PA.
DESCRIPTORS: (*LIQUID ROCKET PROPELLANTS; *ROCKET OXIDIZERS; ROCKET FUELS; CHEMICAL PROPERTIES; COMBUSTION; *IGNITION; STABILITY; SPECIFIC IMPULSE; THEORY.) (LIQUEFIED GASES OXYGEN; OXYGEN COMPOUNDS; OZONE; FLUORIDES; PENTABORANES; DIBORANES; FLUORINE.) (ROCKET MOTORS; MODEL TESTS; TEST METHODS; TEST EQUIPMENT; DESIGN.)

*ROCKET PROPELLANTS

AD-270 927 62-2-2 DIV. 27
REPUBLIC AVIATION CORP., FARMINGDALE, N. Y.
DESCRIPTORS: (ROCKET MOTORS; *HYPERSONICS; ROCKET PROPELLANTS; HYPERVELOCITY VEHICLES.) (*ROCKET PROPELLANTS; DETONATION; HEAT OF REACTION; DISSOCIATION; RECOMBINATION REACTIONS; HYDROGEN; AIR; NITROGEN; ACETYLENES.) (ATMOSPHERE MODELS; IONOSPHERE MODELS.)

*RUBY

AD-271 100 62-2-2 DIV. 25
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: *MASERS; *BIBLIOGRAPHY; *MICROWAVE AMPLIFIERS; *FREQUENCY STABILIZERS; USSR; ELECTRONICS; SCIENTIFIC RESEARCH; *RUBY; *PARAMAGNETIC RESONANCE; CRYOGENICS; PARAMETRIC AMPLIFIERS.

*SAFETY

AD-271 117 62-2-2 DIV. 8
NAVAL ORDNANCE TEST STATION, CHINA LAKE, CALIF.
DESCRIPTORS: (*RADIOFREQUENCY FILTERS, *LOW-PASS FILTERS, SUPPRESSORS, *RADIATION HAZARDS, DESIGN.) (EXPLOSIONS, EXPLOSIVE ACTUATORS, *ORDNANCE, *SAFETY, ELECTRIC IGNITERS, FIRING CIRCUITS, ELECTROMAGNETIC FIELDS, ELECTRICAL NETWORKS, RADIO INTERFERENCE, REDUCTION.)

*SALIVA

AD-271 086 62-2-2 DIV. 16
DENTAL RESEARCH FACILITY, NAVAL TRAINING CENTER, GREAT LAKES, ILL.
DESCRIPTORS: (*SALIVA, *INFRARED SPECTROSCOPY, MAN, ABSORPTION, MEASUREMENT, IMMUNIZATION.) (*DENTAL PLAQUES, *DENTAL CARIES, CHEMICAL ANALYSIS.)

AD-271 087 62-2-2 DIV. 16
DENTAL RESEARCH FACILITY, NAVAL TRAINING CENTER, GREAT LAKES, ILL.
DESCRIPTORS: (*SALIVA, *INFRARED SPECTROSCOPY, MAN, DETECTION, CHEMICAL PROPERTIES, ABSORPTION.) (*BICARBONATES, BIOCHEMICAL TESTS.)

*SANDWICH PANELS

AD-271 429 62-2-2 DIV. 17
NARMCO INDUSTRIES, INC., SAN DIEGO, CALIF.
DESCRIPTORS: (*STAINLESS STEEL, SHEETS, *SANDWICH PANELS, *HONEYCOMB CORES, BONDING, BONDED JOINTS, METAL JOINTS, BRAZING.) (*ADHESIVES, *METAL SEALS, SEALS, MATERIALS, CERAMIC MATERIALS, GLASS, COPPER ALLOYS, SILVER ALLOYS.) (HIGH TEMPERATURE RESEARCH, HIGH PRESSURE RESEARCH, PROCESSING, MECHANICAL PROPERTIES, TENSILE PROPERTIES.)

*SATELLITE ATTITUDE

AD-271 383 62-2-2 DIV. 12
APPLIED PHYSICS LAB., JOHNS HOPKINS U., SILVER SPRING, MD.
DESCRIPTORS: (SATELLITE VEHICLES, NAVIGATION, STABILIZATION, *SATELLITE ATTITUDES, MAGNETIC GUIDANCE, GRAVITY, MAGNETIC FIELDS FROM EARTH, THEORY, MATHEMATICAL ANALYSIS.) (SOLAR ENERGY FOR SOLAR CELLS.)

*SATELLITE VEHICLE ANTENNAS

AD-271 378 62-2-2 DIV. 8
APPLIED PHYSICS LAB., JOHNS HOPKINS U., SILVER SPRING, MD.
DESCRIPTORS: (*SATELLITE VEHICLE ANTENNAS, *DIPOLE ANTENNAS, THEORY.) (*ANTENNAS, ELECTRIC FIELDS, *ANTENNA RADIATION PATTERNS, MATHEMATICAL ANALYSIS.)

AD-271 518 62-2-2 DIV. 5
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON, D. C.
DESCRIPTORS: (*SATELLITE VEHICLE ANTENNAS, *TELEMETERING ANTENNAS, ANTENNAS, DESIGN.) (SATELLITE VEHICLES, SPACESHIPS, SPHERES, COMMUNICATIONS SYSTEMS.)

*SATELLITE VEHICLES

AD-270 974 62-2-2 DIV. 10
LITTLE, ARTHUR D., INC., CAMBRIDGE, MASS.
DESCRIPTORS: (*LIQUID ROCKET PROPELLANTS, *SPACE ENVIRONMENTAL CONDITIONS, STORAGE, THERMAL RADIATION, THERMAL INSULATION, CRATERING, IMPACT SHOCK, IONIZATION, RADIATION DAMAGE, HEAT TRANSFER, PROPELLANT TANKS, SPALLATION, THERMAL CONDUCTIVITY, (*SPACE FLIGHT, *SATELLITE VEHICLES, HYPERVELOCITY VEHICLES, METEORS, HAZARDS.)

AD-271 037 62-2-2 DIV. 5
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*RADIO COMMUNICATION SYSTEMS, COMMUNICATION SYSTEMS, MILITARY COMMUNICATIONS, AIR FORCE COMMUNICATIONS, RADIO RELAY SYSTEMS, *SATELLITE VEHICLES, AIRBORNE, *BIBLIOGRAPHY.)

AD-271 066 62-2-2 DIV. 26
BEHAVIORAL SCIENCES LAB., AEROSPACE MEDICAL DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: (*HUMAN ENGINEERING, SPACE FLIGHT.) (*SPACESHIPS, *SATELLITE VEHICLES, *MAINTENANCE, MAINTENANCE PERSONNEL, SENSORY PERCEPTION, WEIGHTLESSNESS, VISUAL ACUITY, MOTOR REACTIONS, POSITIONING REACTIONS.) (*REMOTE CONTROL SYSTEMS, TEST EQUIPMENT, DESIGN.)

*SCATTERING

AD-270 903 62-2-2 DIV. 20
RIAS, INC., BALTIMORE, MD.
DESCRIPTORS: (PARTICLES, *PIONS, ENERGY, *SCATTERING, RESONANCE ABSORPTION, WAVE ANALYSIS, RESONANCE SCATTERING, DIFFRACTION.) (POLYNOMIALS, INTEGRALS, ALGEBRAIC TOPOLOGY.)

AD-271 417 62-2-2 DIV. 25
GENERAL ATOMIC DIV., GENERAL DYNAMICS CORP., SAN DIEGO, CALIF.
DESCRIPTORS: (*HYDROGEN, ATOMS, *OXYGEN, *HELIUM, *HEAT TRANSFER, *SCATTERING, PROTONS, *ATOMIC ENERGY LEVELS, RESONANCE.) (ION BEAMS, PHOTOELECTRIC CELLS, OSCILLOSCOPES, ELECTRON GUNS.)

*SEALS

AD-271 561 62-2-2 DIV. 26
KNIGHTS, JAMES, CO., SANDWICH, ILL.
DESCRIPTORS: (*CRYSTAL OSCILLATORS, QUARTZ CRYSTALS, GLASS SEALS, VACUUM SEALS, *SEALS, *CRYSTAL HOLDERS, *HEATING ELEMENTS, MANUFACTURING METHODS.) MINIATURE ELECTRONIC EQUIPMENT.

*SEISMIC WAVES

AD-271 147 62-2-2 DIV. 2
SASKATCHEWAN U. (CANADA).
DESCRIPTORS: (MANITOBA, GEOPHYSICAL PROSPECTING, *SEISMIC WAVES, MEASUREMENT, SEISMOLOGICAL STATIONS.)

AD-271 513 62-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*EARTHQUAKES, CLASSIFICATION, *SEISMIC WAVES, ATTENUATION, NOMOGRAPHS.)

*SELECTION

AD-271 483 62-2-2 DIV. 23
PSYCHOLOGICAL RESEARCH ASSOCIATES, INC., ARLINGTON, VA.
DESCRIPTORS: (*TRAINING, *MILITARY TRAINING, *SELECTION OF TRAINING DEVICES, EFFECTIVENESS.) (*JOB ANALYSIS, AVIATION PERSONNEL.)

*SEMICONDUCTING FILMS

AD-271 648 62-2-2 DIV. 8
ARMOUR RESEARCH FOUNDATION, CHICAGO, ILL.
DESCRIPTORS: (SEMICONDUCTORS, *THIN FILMS, *SEMICONDUCTING FILMS, *DIELECTRIC FILMS, *METAL FILMS, MANUFACTURING METHODS, CONDUCTIVITY, HALL EFFECT, DIELECTRIC PROPERTIES, ELECTRICAL PROPERTIES, CRYSTAL STRUCTURE, X-RAY DIFFRACTION ANALYSIS.) (METALLIC SMOKE DEPOSITS, SURFACES, METALS, LIQUID METALS.) (SILICON COMPOUNDS, TITANIUM COMPOUNDS, DIOXIDES, CARBIDES, BORIDES, BORON, BORON COMPOUNDS, PHOSPHIDES, MERCURY COMPOUNDS, SELENIDES, TELLURIDES, TITANIUM ALLOYS, COPPER ALLOYS, BONDING, ANTIOXIDANTS.)

*SEMICONDUCTORS

AD-270 961 62-2-2 DIV. 14
PLASTICS LAB., PRINCETON U., N. J.
DESCRIPTORS: (*POLYMERS, *PLASTICS, *FERROCENES, *DIELECTRICS, *SEMICONDUCTORS, ORGANIC MATERIALS, DIELECTRIC PROPERTIES, ELECTRICAL PROPERTIES, CONDUCTIVITY, SYNTHESIS, MECHANICAL PROPERTIES, PHASE STUDIES, VISCOSITY, TEST METHODS, PRESSURE.) (POLYMERIZATION, ETHYLENES, ORGANIC COMPOUNDS, VINYL RADICALS, ALLYL RADICALS.) (BUTADIENES, BUTENES, PROPENES.) METHODS, PRESSURE,) (POLYMERIZATION, ETHYLENES, ORGANIC COMPOUNDS, VINYL RADICALS, ALLYL RADICALS.) (BUTADIENES, BUTENES, PROPENES.)

AD-270 992 62-2-2 DIV. 25
NEW YORK STATE COLL. OF CERAMICS, ALFRED U.
DESCRIPTORS: (*SEMICONDUCTORS, PREPARATION, SINGLE CRYSTALS, CRYSTALS, CADMIUM COMPOUNDS, ZINC COMPOUNDS, LEAD COMPOUNDS, TELLURIDES, BISMUTH COMPOUNDS, SELENIDES, BORON COMPOUNDS, PHOSPHIDES, PHOTOCONDUCTIVITY, THERMOELECTRICITY, MEASUREMENT, HALL EFFECT, RESISTANCE, COOLING, GROWTH.)

AD-271 030 62-2-2 DIV. 8
TEXAS INSTRUMENTS, INC., DALLAS.
DESCRIPTORS: (*RESISTORS, *SEMICONDUCTORS, MATERIALS, SILICON, TITANIUM COMPOUNDS, DIOXIDES, SILICON COMPOUNDS, GALLIUM COMPOUNDS, ARSENIDES, LEAD COMPOUNDS, TELLURIDES, INDIUM COMPOUNDS, ANTIMONIDES, SELENIUM COMPOUNDS, CRYSTALS, SINGLE CRYSTALS, CARBIDES, BORIDE, CHEMICAL IMPURITIES.)

AD-271 404 62-2-2 DIV. 8
MICROWAVE ASSOCIATES, INC., BURLINGTON, MASS.
DESCRIPTORS: (*PHASE SHIFTERS, *SEMICONDUCTORS MICROWAVE EQUIPMENT, L BAND, ELECTRONIC CIRCUITS, ELECTRONIC SCANNERS, DIODES, WAVE-

AD-271 469 62-2-2 DIV. 25
NAVAL ORDNANCE LAB., WHITE OAK, MD.
DESCRIPTORS: (*SEMICONDUCTORS, *INDIUM COMPOUNDS, *GALLIUM COMPOUNDS, *ARSENIDES, *ANTIMONIDES, INTERMETALLIC COMPOUNDS, OPTICS, REFLECTION, REFRACTIVE INDEX, REFRACTIVE PROPERTIES, LIGHT, ABSORPTION, MATHEMATICAL ANALYSIS, INTEGRAL EQUATIONS.) (ULTRAVIOLET SPECTROSCOPY, INFRARED SPECTROSCOPY, SPECTROPHOTOMETERS, PHOTOMULTIPLIERS.)

AD-271 587 62-2-2 DIV. 25
NAVAL ORDNANCE LAB., CORONA, CALIF.
DESCRIPTORS: (*TELEPHONE COMMUNICATION SYSTEMS, PANEL BOARDS (ELECTRICITY), NOISE GENERATORS, THEORY, DESIGN.) (*FERROMAGNETSM, *IRON ALLOYS, *NICKEL ALLOYS, FILMS.) (*RARE GASES, INFRARED SPECTROSCOPY, INTERFEROPETERS, ELECTROMAGNETIC WAVES, WAVE TRANSMISSION.) (*SEMICONDUCTORS, *SILICON, MAGNETO-OPTIC ROTATION.) (*HEAT RESISTANT POLYMERS, *POLYMERS, *PHOSPHINES, PHENYL RADICALS, CHLORIDES, SYNTHESIS, CHEMICAL REACTIONS.) (SOLID STATE PHYSICS, *MICROWAVE OSCILLATORS, *DIODES, *RARE EARTH COMPOUNDS, CALCIUM COMPOUNDS, FLUORIDES, *THULIUM COMPOUNDS, SPECTROPHOTOMETERS, ABSORPTION, FLUORESCENCE, CRYSTALS.)

(*GUIDED MISSILE ANTENNAS, *SLOT ANTENNAS, *WAVEGUIDE SLOTS, DIELECTRICS, ANTENNA RADIATION PATTERNS, MEASUREMENT.)

*SERVOMECHANISMS

AD-271 039 62-2-2 DIV. 12
LOCKHEED AIRCRAFT CORP., SUNNYVALE, CALIF.
DESCRIPTORS: (*SERVOMECHANISMS, ANALYSIS, ELECTRIC SERVOMECHANISMS, *SIMULATION, ANALOG SYSTEMS.) (ELECTRIC MOTORS, ANALYSIS, NUMERICAL METHODS AND PROCEDURES.)

*SHAFTS

AD-271 617 62-2-2 DIV. 25
MANHATTAN COLL., NEW YORK.
DESCRIPTORS: (VIBRATION, *TORQUE, *SHAFTS, DAMPING.) (INTERNAL COMBUSTION ENGINES, GENERATORS.) NUMERICAL METHODS AND PROCEDURES.

*SHEAR STRESSES

AD-271 151 62-2-2 DIV. 25
MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*METALS, *CANTILEVER BEARS, *FATIGUE (MECHANICS), *VIBRATION, *SHEAR STRESSES, LOADING, DEFORMATION, *LOAD DISTRIBUTION.) (TIME, MATERIALS, FREQUENCY, DAMPING, OSCILLATION.) (PROBABILITY, STATISTICAL DISTRIBUTIONS, STATISTICAL FUNCTIONS, HARMONIC ANALYSIS, STATISTICAL PROCESSES, GEOMETRY, INTEGRATION, DIFFERENTIAL EQUATIONS, INTEGRAL EQUATIONS, NUMERICAL ANALYSIS, SEQUENCES.)

AD-271 631 62-2-2 DIV. 25
ISRAEL INST. OF TECH., HAIFA.
DESCRIPTORS: (*CYLINDRICAL BODIES, *SHEAR STRESSES, ELASTICITY, LOADING, DEFORMATION, FATIGUE (MECHANICS), BUCKLING, STABILITY, ANALYSIS.) (LINEAR SYSTEMS, THEORY, *DIFFERENTIAL EQUATIONS, GEOMETRY, POLYNOMIALS.)

*SHEETS

AD-270 924 62-2-2 DIV. 9
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*SHEETS, SEPARATION, PRESSURE, WEDGES, CURVED PROFILES, SURFACE PROPERTIES, *AERODYNAMICS, MACH NUMBER.) (GASES, SUPERSONIC FLOW, TURBULENT BOUNDARY LAYER, SHOCK WAVES, REYNOLDS NUMBER, WIND TUNNELS.) (FEASIBILITY STUDIES.)

AD-270 955 62-2-2 DIV. 17
WAH CHANG CORP., ALBANY, OREG.
DESCRIPTORS: (*HEAT RESISTANT ALLOYS, *TANTALUM ALLOYS, NIOBIUM ALLOYS, VANADIUM ALLOYS, TUNGSTEN ALLOYS, *SHEETS, ROLLING MILLS, RELIABILITY, PRODUCTION, MANUFACTURING METHODS, POWDER METALLURGY, MELTING, PROCESSING, EXTRUSION, FORGING.) (PHYSICAL PROPERTIES, PHASE TRANSITIONS, TRANSITION TEMPERATURE, STRESSES, RUPTURE, HEAT TREATMENT, DEFORMATION, TENSILE PROPERTIES, WELDING, OXIDATION, MACHINING.) AIRFRAMES, GUIDED MISSILES, SPACESHIPS.

*SHIP HULLS

AD-271 460 62-2-2 DIV. 31
J. G. ENGINEERING RESEARCH ASSOCIATES, BALTIMORE, MD.
DESCRIPTORS: (*SUBMARINE HULLS, VIBRATION, PRESSURE, *ACOUSTIC IMPEDANCE, THEORY.) (SHIP HULLS, SHIP MODELS, STRUCTURAL SHELLS, CYLINDRICAL BODIES, STRESSES, *HYDRODYNAMICS, ACOUSTICS, INTEGRAL EQUATIONS, FUNCTIONS, TRIGONOMETRY.)

*SHOCK WAVES

AD-270 936 62-2-2 DIV. 9
SPACE SCIENCES LAB., GENERAL ELECTRIC CO., PHILADELPHIA, PA.
DESCRIPTORS: (GAS FLOW, *SHOCK WAVES, ELECTRONS, DENSITY, REACTION KINETICS, TEMPERATURE, CHEMICAL REACTIONS, DISSOCIATION, RECOMBINATION REACTIONS, IONIZATION, THEORY.)

AD-271 165 62-2-2 DIV. 22
BALLISTIC RESEARCH LABS., ABERDEEN PROVING GROUND, MD.
DESCRIPTORS: (*BLAST, *SHOCK WAVES, COPPER, *BIRE, *EXPLOSIONS, ARGON, INTERFERGMETERS, PLASMA PHYSICS, ELECTRONS, DENSITY.)

*SHORT TAKE-OFF PLANES

AD-270 966 62-2-2 DIV. 9
PRINCETON U., N. J.
DESCRIPTORS: (EXPERIMENTAL DATA, *WINGS, AERODYNAMIC CONFIGURATIONS, *AERODYNAMICS, *MOMENTS, WIND TUNNELS, SUBSONIC FLOW, VARIABLE PITCH PROPELLERS,) (*SHORT TAKE-OFF PLANES, AERODYNAMICS.) (LIFT, DRAG.)

*SILICON

AD-271 587 62-2-2 DIV. 25
NAVAL ORDNANCE LAB., CORONA, CALIF.
DESCRIPTORS: (*TELEPHONE COMMUNICATION SYSTEMS, PANEL BOARDS (ELECTRICITY), NOISE GENERATORS, THEORY, DESIGN.) (*FERROMAGNETSM,

•IRON ALLOYS; •NICKEL ALLOYS; FILMS.) (•RARE GASES; INFRARED SPECTROSCOPY; INTERFEROMETERS; ELECTROMAGNETIC WAVES; WAVE TRANSMISSION.) (•SEMICONDUCTORS; •SILICON; MAGNETO-OPTIC ROTATION.) (•HEAT RESISTANT POLYMERS; •POLYMERS; •PHOSPHINES; PHENYL RADICALS; CHLORIDES; SYNTHESIS; CHEMICAL REACTIONS.) (SOLID STATE PHYSICS; •MICROWAVE OSCILLATORS; •DIODES; •RARE EARTH COMPOUNDS; CALCIUM COMPOUNDS; FLUORIDES; •THULIUM COMPOUNDS; SPECTROPHOTOMETERS; ABSORPTION; FLUORESCENCE; CRYSTALS.) (•GUIDED MISSILE ANTENNAS; •SLOT ANTENNAS; •WAVEGUIDE SLOTS; DIELECTRICS; ANTENNA RADIATION PATTERNS; MEASUREMENT.)

AD-271 633 62-2-2 DIV. 25
SYLVANIA ELECTRIC PRODUCTS; INC.; WOBURN; MASS.
DESCRIPTORS: (•DIODES; SILICON COMPOUNDS; SILANES; CHLORIDES; DIFFUSION; VAPORS; DEPOSITS; •THIN FILMS; TEMPERATURE; •SILICON; CRYSTALS; •SINGLE CRYSTALS; GROWTH; THICKNESS; RESISTANCE.) (CHEMICAL IMPURITIES; PHOSPHORUS; BORON COMPOUNDS; BROMIDES.) GASES; ARGON.

•SILICONES

AD-271 491 62-2-2 DIV. 8
INORGANIC RESEARCH LAB.; WESTERN RESERVE U.; CLEVELAND; OHIO.
DESCRIPTORS: (•METALORGANIC COMPOUNDS; ESTERS; PHENYL RADICALS; •SILICONES; THIO RADICALS; •VANADATES; VANADIUM COMPOUNDS; SYNTHESIS; CHEMICAL ANALYSIS.)

•SILVER COMPOUNDS

AD-271 393 62-2-2 DIV. 25
ILLINOIS U.; URBANA.
DESCRIPTORS: (•SILVER COMPOUNDS; •BROMIDES; •CHLORIDES; CRYSTALS; ELECTRONS; MAGNETIC FIELDS; •MAGNETIC EFFECTS; •CONDUCTIVITY; PHOTOELECTRONS; RESISTANCE.) (THEORY; SEMICONDUCTORS; METALS; PHOTOCONDUCTIVITY; HALL EFFECT.) TEST METHODS; TEST EQUIPMENT; •HALIDES.

AD-271 421 62-2-2 DIV. 25
GEORGIA INST. OF TECH.; ENGINEERING EXPERIMENT STATION; ATLANTA.
DESCRIPTORS: (•CRYSTALS; SINGLE CRYSTALS; •ALUMINUM; •SILVER COMPOUNDS; •SODIUM COMPOUNDS; •CHLORIDES; X-RAY DIFFRACTION ANALYSIS; CRYSTAL STRUCTURE; TEMPERATURE; HIGH TEMPERATURE RESEARCH; THERMAL EXPANSION; THERMAL DIFFUSION; THEORY.) (TEST METHODS; TEST EQUIPMENT; X-RAY FILTERS.)

•SIMULATION

AD-271 039 62-2-2 DIV. 12
LOCKHEED AIRCRAFT CORP.; SUNNYVALE; CALIF.
DESCRIPTORS: (•SERVOMECHANISMS; ANALYSIS; ELECTRIC SERVOMECHANISMS; •SIMULATION; ANALOG SYSTEMS.) (ELECTRIC MOTORS; ANALYSIS; NUMERICAL METHODS AND PROCEDURES.)

•SINGLE CRYSTALS

AD-270 906 62-2-2 DIV. 25
HAMMOND METALLURGICAL LAB.; YALE U.; NEW HAVEN; CONN.
DESCRIPTORS: (•LEAD COMPOUNDS; •SULFIDES; •SINGLE CRYSTALS; GROWTH; CHEMICAL IMPURITIS; DEFORMATION; PLASTICITY; DENSITY.) (FRACTUE (MECHANICS); REACTION KINETICS; STRESSES; PRISMS; POLARIZATION; MECHANICAL PROPERTIES.) MICROPHOTOGRAPHY.

AD-271 385 62-2-2 DIV. 25
CARBORUNDUM CO.; NIAGARA FALLS; N. Y.
DESCRIPTORS: (•SINGLE CRYSTALS; •CERAMIC MATERIALS; •MAGNESIUM COMPOUNDS; OXIDES; SILICON COMPOUNDS; CARBIDES; PREPARATION; GROWTH; MECHANICAL PROPERTIES; TESTS.) (FRACTURE (MECHANICS); HIGH TEMPERATURE RESEARCH; STRESSES; DEFORMATION; SHEAR STRESSES; PLASTIC FLOW.) (ULTRASONICS; CUTTING TOOLS; TEST EQUIPMENT.)

AD-271 435 62-2-2 DIV. 8
LANSDALE DIV.; PHILCO CORP.; PA.
DESCRIPTORS: (•TRANSISTORS; MANUFACTURING METHODS; PRODUCTION; DESIGN.) (SILICON; •SINGLE CRYSTALS; SERVO SYSTEMS; ELECTRODES, ELECTROPLATING; SOLDERING; ATTACHMENT.)

AD-271 586 62-2-2 DIV. 17
KECK; W. M.; LAB. OF ENGINEERING MATERIALS; CALIF. INST. OF TECH.; PASADENA.
DESCRIPTORS: (•SINGLE CRYSTALS; •ZINC; CRYSTAL STRUCTURE; MICROSTRUCTURE, LATTICES; DEFORMATION.) (PREPARATION; PURIFICATION; ZONE MELTING; METALLIC CRYSTALS; GROWTH; ELECTROLYTIC POLISHING; SOLUTIONS.)

AD-271 633 62-2-2 DIV. 25
SYLVANIA ELECTRIC PRODUCTS; INC.; WOBURN; MASS.
DESCRIPTORS: (•DIODES; SILICON COMPOUNDS; SILANES; CHLORIDES; DIFFUSION; VAPORS; DEPOSITS; •THIN FILMS; TEMPERATURE; •SILICON; CRYSTALS; •SINGLE CRYSTALS; GROWTH; THICKNESS; RESISTANCE.) (CHEMICAL IMPURITIES; PHOSPHORUS; BORON COMPOUNDS; BROMIDES.) GASES; ARGON.

•SKIN

AD-270 948 62-2-2 DIV. 16
MATERIAL LAB.; NEW YORK NAVAL SHIPYARD; BROOKLYN.
DESCRIPTORS: (•THERMAL RADIATION; GAS FLOW; AIR; •SKIN; •BURNS; PROTECTIVE CLOTHING; CLOTHING; •COTTON TEXTILES; HEAT TRANSFER; RADIATION EFFECTS.) (TEST METHODS; TEST EQUIPMENT; CARBON ARC LAMPS; SKIN; SIMULATION; PLASTICS.)

AD-270 951 62-2-2 DIV. 14
MATERIAL LAB.; NEW YORK NAVAL SHIPYARD; BROOKLYN.
DESCRIPTORS: (•RADIATION EFFECTS; •THERMAL RADIATION; SOURCES; MATERIALS; PAINTS; COATINGS; TEXTILES; PLASTICS; CERAMIC MATERIALS; ASPHALT; FUELS.) (•SKIN; SIMULATION; POLYMERS; ETHYLENES; BURNS; REFLECTION.) (TEST METHODS; TEST EQUIPMENT; INCANDESCENT LAMPS TUNGSTEN.)

•SLOT ANTENNAS

AD-270 918 62-2-2 DIV. 8
WASHINGTON U.; SEATTLE; COLL. OF ENGINEERING.
DESCRIPTORS: (•SLOT ANTENNAS; X BAND; ANTENNA RADIATION PATTERNS; ATTENUATION; MEASUREMENT; MATHEMATICAL ANALYSIS.) (ANTENNAS; •WAVEGUIDE SLOTS; MICROWAVE EQUIPMENT; MICROWAVES; PROPAGATION; ELECTROMAGNETIC PROPERTIES; ELECTROMAGNETIC FIELDS.)

AD-271 667 62-2-2 DIV. 8
AIRBORNE INSTRUMENTS LAB.; INC.; DEER PARK; LONG ISLAND; N. Y.
DESCRIPTORS: (•SLOT ANTENNAS; DIPOLE ANTENNAS; IMPEDANCE MATCHING; ULTRA HIGH FREQUENCY; WIRE; DESIGN; ANTENNA RADIATION PATTERNS; MEASUREMENT.) ANTENNAS.

•SODIUM COMPOUNDS

AD-271 421 62-2-2 DIV. 25
GEORGIA INST. OF TECH.; ENGINEERING EXPERIMENT STATION; ATLANTA.
DESCRIPTORS: (•CRYSTALS; SINGLE CRYSTALS; •ALUMINUM; •SILVER COMPOUNDS; •SODIUM COMPOUNDS; •CHLORIDES; X-RAY DIFFRACTION ANALYSIS; CRYSTAL STRUCTURE; TEMPERATURE; HIGH TEMPERATURE RESEARCH; THERMAL EXPANSION; THERMAL DIFFUSION; THEORY.) (TEST METHODS; TEST EQUIPMENT; X-RAY FILTERS.)

•SOILS

AD-271 159 62-2-2 DIV. 2
AGRICULTURAL RESEARCH SERVICE; RIVERSIDE; CALIF.
DESCRIPTORS: (WATER; EVAPORATION; •EVAPOTRANSPIRATION; •SOILS; MONTMORILLONITE; ATMOSPHERE; •MICROMETEOROLOGY.) (VAPOR PRESURE; HYGROMETERS, TEMPERATURE; RESISTANCE THERMOMETERS.)

•SOLAR CELLS

AD-271 036 62-2-2 DIV. 20
LOCKHEED AIRCRAFT CORP.; SUNNYVALE; CALIF.
DESCRIPTORS: (•BIBLIOGRAPHY; •RADIATION EFFECTS; •SOLAR CELLS; GLASS.)

AD-271 358 62-2-2 DIV. 7
SPECTROLAB; INC.; NORTH HOLLYWOOD; CALIF.
DESCRIPTORS: (SATELLITE VEHICLES; POWER SUPPLIES; SILICON; •SOLAR CELLS; •OPTICAL COATINGS; •INFRARED FILTERS; THEORY.) (TESTS; THERMODYNAMICS; WAVE TRANSMISSION; REFLECTION; BLACKBODY RADIATION; SPACE ENVIRONMENTAL CONDITIONS; STABILITY; RADIATION EFFECTS; BETA PARTICLES; INFRARED RADIATION.) (RARE EART; •RARE EARTH COMPOUNDS; FLUORIDES; OXYFLUORIDES.) (COATINGS; VAPOR PLATING.) (RESIN ADHESIVES; BONDING.)

AD-271 599 62-2-2 DIV. 14
SPECTROLAB; INC.; NORTH HOLLYWOOD; CALIF.
DESCRIPTORS: (•SOLAR CELLS; •OPTICAL COATINGS PROTECTIVE COVERINGS; OPTICAL FILTERS; TESTS; GLASS.) (POWER SUPPLIES; SOLAR ENERGY; SEMICONDUCTORS.)

•SOLAR CORONA

AD-271 512 62-2-2 DIV. 2
AEROSPACE INFORMATION DIV.; WASHINGTON; D. C.
DESCRIPTORS: (IONOSPHERE; IONIZATION.) (•AURORAE; NIGHT SKY; LUMINESCENCE.) (•SOLAR CORONA; SOLAR FLARES; POLARIZATION.) VAN ALLEN RADIATION BELT; •COSMIC RAYS; •ATMOSPHERIC ELECTRICITY; •PLASMA PHYSICS.

•SOLAR FLARES

AD-271 004 62-2-2 DIV. 2
MICROWAVE LAB.; STANFORD U.; CALIF.
DESCRIPTORS: (•ASTROPHYSICS; ELECTROMAGNETC WAVES; •PLASMA OSCILLATIONS; THERMAL RADIATION; PLASMA PHYSICS.) (SHOCK WAVES; MAGNETOHYDRODYNAMICS.) (EXTRATERRESTRIAL RADIO WAVES; MAGNETIC STORMS; •SOLAR FLARES; SOLAR CORONA; TERRESTRIAL MAGNETISM; GAS IONIZATION.) (HARMONIC ANALYSIS; NONLINEAR SYSTEMS.)

•SOLID DELAY LINES

AD-271 422 62-2-2 DIV. 25
GENERAL ELECTRIC CO.; SYRACUSE; N. Y.
DESCRIPTORS: (•DELAY LINES; MICROWAVE FREQUENCY; •MICROWAVE EQUIPMENT; •SOLID STATE PHYSICS.) (ACOUSTICS; •SOLID DELAY LINES; •MAGNETOSTRICTIVE ELEMENTS; TRANSDUCERS; MAGNETOSTRICTION TRANSDUCERS.) (MICROWAVES, PROPAGATION; SINGLE CRYSTALS; SILICON; GERMANIUM; HYPERSONICS; ATTENUATION.) (PIEZOELECTRIC EFFECT; QUARTZ CRYSTALS; X BAND; WAVEGUIDES.) (BONDING; SEMICONDUCTORS; SILICONES; GREASES; CRYOGENICS; THIN FILMS.)

•SOLID ROCKET PROPELLANTS

AD-270 929 62-2-2 DIV. 10
ATLANTIC RESEARCH CORP.; ALEXANDRIA; VA.
DESCRIPTORS: (•SOLID ROCKET PROPELLANTS; •ROCKET OXIDIZERS; •COMBUSTION; IGNITION; REACTION KINETICS; FLAMES; FLAME PROPAGATION; PRESSURE; THEORY; DECOMPOSITION; THERMOCHEMISTRY.) (•PERCHLORIC ACIDS; VAPORS; CHEMICAL REACTIONS; AMMONIA.) (AMMONIUM RADICALS; POTASSIUM COMPOUNDS; •PERCHLORATES AND METHANES; MIXTURES OF BINDERS; POLYMERS; VINYLCHLORIDES; CARBOXYLIC ACIDS.)

AD-271 375 62-2-2 DIV. 10
APPLIED PHYSICS LAB.; JOHNS HOPKINS U.; SILVER SPRING; MD.
DESCRIPTORS: (ROCKET MOTORS; •SOLID ROCKET PROPELLANTS; COMBUSTION; COMBUSTION CHAMBER GASES; EXHAUST GASES; EXHAUST FLAMES; THERMAL CONDUCTIVITY; REACTION KINETICS; CHEMICAL REACTIONS; DISSOCIATION; CONDENSATION REACTIOS; RECOMBINATION REACTIONS; TESTS.) (•ROCKET MOTOR NOZZLES; FLAMES; GAS FLOW; BOUNDARY LAYER; LAMINAR BOUNDARY LAYER; TURBULENT BOUNDARY LAYER; HEAT TRANSFER; THERMODYNAMICS.) (TEST METHODS; TEST EQUIPMENT.)

•SOLID STATE PHYSICS

AD-271 181 62-2-2 DIV. 25
ILLINOIS U.; URBANA.
DESCRIPTORS: (•SUPERCONDUCTORS; SUPERCONDUCTIVITY.) (•QUANTUM STATISTICS; CALCULUS OF VARIATIONS; MATRIX ALGEBRA.) (•ELECTROMAGNETIC THEORY; PARTICLES; ELECTRONS; PHONONS; EXCITATION; RELAXATION TIME; PARAMAGNETIC CRYSTALS.) (EQUATIONS OF ENERGY AND MOTION; HARMONIC ANALYSIS.) SOLID STATE PHYSICS; THESES.

AD-271 422 62-2-2 DIV. 25
GENERAL ELECTRIC CO.; SYRACUSE; N. Y.
DESCRIPTORS: (•DELAY LINES; MICROWAVE FREQUENCY; •MICROWAVE EQUIPMENT; •SOLID STATE PHYSICS.) (ACOUSTICS; •SOLID DELAY LINES; •MAGNETOSTRICTIVE ELEMENTS; TRANSDUCERS; MAGNETOSTRICTION TRANSDUCERS.) (MICROWAVES, PROPAGATION; SINGLE CRYSTALS; SILICON; GERMANIUM; HYPERSONICS; ATTENUATION.) (PIEZOELECTRIC EFFECT; QUARTZ CRYSTALS; X BAND; WAVEGUIDES.) (BONDING; SEMICONDUCTORS; SILICONES; GREASES; CRYOGENICS; THIN FILMS.)

AD-271 630 62-2-2 DIV. 25
SPERRY MICROWAVE ELECTRONICS CO.; CLEARWATER; FLA.
DESCRIPTORS: (FERROMAGNETISM; FERROMAGNETIC MATERIALS; NONLINEAR SYSTEMS; •HARMONIC OSCILLATORS; •RADIOFREQUENCY FILTERS.) (FERRITES; GARNET; BAND-PASS FILTERS, ELECTRONICS; •SOLID STATE PHYSICS.)

•SOLIDS

AD-271 534 62-2-2 DIV. 25
BROWN U. DIV. OF APPLIED MATHEMATICS; PROVIDENCE; R. I.
DESCRIPTORS: (•ELASTICITY; VISCOSITY; •SOLIDS; •LINEAR SYSTEMS; STRESSES; DEFORMATION.) (PATHEMATICAL ANALYSIS; STRESSES; PARTIAL DIFFERENTIAL EQUATIONS.)

•SONAR

AD-271 626 62-2-2 DIV. 6
STRAZA INDUSTRIES; EL CAJON; CALIF.
DESCRIPTORS: (•DISPLAY SYSTEMS; •SONAR; SONAR EQUIPMENT; OPTICAL FILTERS; LUMINESCECE; BRIGHTNESS; SOLID STATE PHYSICS; •PHOTOCONDUCTIVITY; THIN FILMS; MATERIALS; COATINGS; DESIGN; TEST EQUIPMENT; PRODUCTION; TIN COMPOUNDS; OXIDES.)

•SPACE ENVIRONMENTAL CONDITIONS

AD-270 974 62-2-2 DIV. 10
LITTLE; ARTHUR D.; INC.; CAMBRIDGE; MASS.
DESCRIPTORS: •LIQUID ROCKET PROPELLANTS; •SPACE ENVIRONMENTAL CONDITIONS; STORAGE; THERMAL RADIATION; THERMAL INSULATION; CRATERING; IMPACT SHOCK; IONIZATION; RADIATION DAMAGE; HEAT TRANSFER; PROPELLANT TANKS; SPALLATION; THERMAL CONDUCTIVITY. (•SPACE FLIGHT; •SATELLITE VEHICLES; HYPERVELOCITY VEHICLES; METEORS; HAZARDS.)

•SPACE FLIGHT

AD-270 925 62-2-2 DIV. 12
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION; WASHINGTON; D. C.
DESCRIPTORS: (•SPACE FLIGHT; MARS; •SPACE NAVIGATION; •GUIDANCE; SENSITIVITY; PERTURBA-

TION THEORY. MATHEMATICAL LOGIC. VECTOR ANALYSIS. SPECIFIC IMPULSE. ORBITAL FLIGHT PATHS.)

AD-270 974 62-2-2 DIV. 10
LITTLE, ARTHUR D., INC., CAMBRIDGE, MASS.
DESCRIPTORS: (*LIQUID ROCKET PROPELLANTS, *SPACE ENVIRONMENTAL CONDITIONS, STORAGE, THERMAL RADIATION, THERMAL INSULATION, CRATERING, IMPACT SHOCK, IONIZATION, RADIATION DAMAGE, HEAT TRANSFER, PROPELLANT TANKS, SPALLATION, THERMAL CONDUCTIVITY, (*SPACE FLIGHT, *SATELLITE VEHICLES, HYPERVELOCITY VEHICLES, METEORS, HAZARDS.)

AD-271 514 62-2-2 DIV. 16
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*LITERATURE, *USSR, *SPACE MEDICINE, *SPACE FLIGHT, BIOLOGY, RADIOBIOLOGY, SURVIVAL, HYPERTHERMIA, BLOOD.)

*SPACE MEDICINE

AD-271 514 62-2-2 DIV. 16
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*LITERATURE, *USSR, *SPACE MEDICINE, *SPACE FLIGHT, BIOLOGY, RADIOBIOLOGY, SURVIVAL, HYPERTHERMIA, BLOOD.)

*SPACE NAVIGATION

AD-270 925 62-2-2 DIV. 12
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*SPACE FLIGHT, MARS, *SPACE NAVIGATION, *GUIDANCE, SENSITIVITY, PERTURBATION THEORY, MATHEMATICAL LOGIC, VECTOR ANALYSIS, SPECIFIC IMPULSE, ORBITAL FLIGHT PATHS.)

*SPACESHIPS

AD-271 066 62-2-2 DIV. 28
BEHAVIORAL SCIENCES LAB., AEROSPACE MEDICAL DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: (*HUMAN ENGINEERING, SPACE FLIGHT,) (*SPACESHIPS, *SATELLITE VEHICLES, *MAINTENANCE, MAINTENANCE PERSONNEL, SENSORY PERCEPTION, WEIGHTLESSNESS, VISUAL ACUITY, MOTOR REACTIONS, POSITIONING REACTIONS,) (*REMOTE CONTROL SYSTEMS, TEST EQUIPMENT, DESIGN.)

*SPECTROPHOTOMETERS

AD-271 545 62-2-2 DIV. 30
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*SPECTROPHOTOMETERS, REFLECTOMETERS,) (*PHOTOMULTIPLIERS WITH AMPLIFIERS,)

AD-271 562 62-2-2 DIV. 30
LUND U. (SWEDEN).
DESCRIPTORS: (*SPECTROPHOTOMETERS, *ULTRAVIOLET SPECTROPHOTOMETERS, DESIGN, MATERIAL, QUARTZ, LOW TEMPERATURE RESEARCH,) SWEDEN.

AD-271 563 62-2-2 DIV. 30
LUND U. (SWEDEN).
DESCRIPTORS: (*PHOTOLYSIS, ORGANIC SOLVENTS, METHYL RADICALS, PENTANES, CARBON COMPOUNDS, SULFIDES, ETHYL RADICALS, IODIDES,) (*SPECTROPHOTOMETERS, DESIGN, LOW TEMPERATURE RESEARCH, *THERMOCHEMISTRY, *CHEMICAL BONDS, *RECOMBINATION REACTIONS, *FREE RADICALS,) SWEDEN.

*SPEECH

AD-270 971 62-2-2 DIV. 5
GENERAL DYNAMICS/ELECTRONICS, ROCHESTER, N. Y.
DESCRIPTORS: (*SPEECH, *SPEECH TRANSMISSION, *VOICE COMMUNICATION SYSTEMS, MULTIPLEX TRANSMISSION, CODING,) (DATA PROCESSING SYSTEMS, DIGITAL SYSTEMS, CIRCUITS,)

AD-271 194 62-2-2 DIV. 5
PHILCO CORP., PHILADELPHIA, PA.
DESCRIPTORS: (*SPEECH, *SPEECH TRANSMISSION, *SPEECH REPRESENTATION, *ELECTRONIC EQUIPMENT, SYNTHESIS, CODING, DESIGN,) (*VOICE COMMUNICATION SYSTEMS, DATA TRANSMISSION SYSTEMS, PRINTED CIRCUITS, ELECTRONIC CIRCUITS, TIMING CIRCUITS, BAND-PASS FILTERS, ANALOG SYSTEMS, DIGITAL SYSTEMS, DESIGN.)

AD-271 606 62-2-2 DIV. 25
BOLT, BERANEK, AND NEWMAN, INC., CAMBRIDGE, MASS.
DESCRIPTORS: (*SPEECH, *INTELLIGIBILITY, MEASUREMENT,) (AUDIOFREQUENCY SIGNAL TO NOISE RATIO, NOISE, DETERMINATION,)

*SPEECH REPRESENTATION

AD-271 194 62-2-2 DIV. 5
PHILCO CORP., PHILADELPHIA, PA.
DESCRIPTORS: (*SPEECH, *SPEECH TRANSMISSION, *SPEECH REPRESENTATION, *ELECTRONIC EQUIPMENT, SYNTHESIS, CODING, DESIGN,) (*VOICE COMMUNICATION SYSTEMS, DATA TRANSMISSION SYSTEMS, PRINTED CIRCUITS, ELECTRONIC CIRCUITS, TIMING CIRCUITS, BAND-PASS FILTERS, ANALOG SYSTEMS, DIGITAL SYSTEMS, DESIGN.)

*SPEECH TRANSMISSION

AD-270 971 62-2-2 DIV. 5
GENERAL DYNAMICS/ELECTRONICS, ROCHESTER, N. Y.
DESCRIPTORS: (*SPEECH, *SPEECH TRANSMISSION, *VOICE COMMUNICATION SYSTEMS, MULTIPLEX TRANSMISSION, CODING,) (DATA PROCESSING SYSTEMS, DIGITAL SYSTEMS, CIRCUITS,)

AD-271 194 62-2-2 DIV. 5
PHILCO CORP., PHILADELPHIA, PA.
DESCRIPTORS: (*SPEECH, *SPEECH TRANSMISSION, *SPEECH REPRESENTATION, *ELECTRONIC EQUIPMENT, SYNTHESIS, CODING, DESIGN,) (*VOICE COMMUNICATION SYSTEMS, DATA TRANSMISSION SYSTEMS, PRINTED CIRCUITS, ELECTRONIC CIRCUITS, TIMING CIRCUITS, BAND-PASS FILTERS, ANALOG SYSTEMS, DIGITAL SYSTEMS, DESIGN.)

AD-271 606 62-2-2 DIV. 25
BOLT, BERANEK, AND NEWMAN, INC., CAMBRIDGE, MASS.
DESCRIPTORS: (*SPEECH, *INTELLIGIBILITY, MEASUREMENT,) (*RADIO SYSTEMS, NOISE (RADIO),) (*AUDITORY PERCEPTION, AUDITORY ACUITY, AUDIOMETRY, TONAL THRESHOLDS, PITCH DISCRIMINATION,)

*SPOTTING RIFLES

AD-271 353 62-2-2 DIV. 22
ROCK ISLAND ARSENAL LAB., ILL.
DESCRIPTORS: (*GUNS, *ARTILLERY, *SPOTTING RIFLES, *RECOIL MECHANISMS, FEASIBILITY STUDIES, MATHEMATICAL ANALYSIS, DESIGN, TESTS,)

*STABILITY

AD-271 450 62-2-2 DIV. 12
SPACE TECHNOLOGY LABS., INC., LOS ANGELES, CALIF.
DESCRIPTORS: (*STABILITY OF *MOTION,) (CURVE FITTING, SPHERES, SATELLITE VEHICLE TRAJECTORIES,) (PERTURBATION THEORY, DIFFERENTIA EQUATIONS,) USSR.

AD-271 614 62-2-2 DIV. 9
HUDSON LAB., COLUMBIA U., DOBBS FERRY, N. Y.
DESCRIPTORS: (*STABILITY OF *FLUID FLOW, VISCOSITY, THERMAL CONDUCTIVITY, HEAT, TEMPERATURE,) (PARTIAL DIFFERENTIAL EQUATIONS, SERIES, INTEGRATION, COMPLEX VARIABLES,)

*STABILIZATION SYSTEMS

AD-271 146 62-2-2 DIV. 12
ILLINOIS U., URBANA.
DESCRIPTORS: (SPIN, *MOTION, ROTATION, EQUATIONS,) (GUIDED MISSILE TRAJECTORIES, *ROCKET MOTORS, FUEL CELLS,) (DYNAMICS, BALLISTICS, GUIDED MISSILES,) *STABILIZATION SYSTEMS.

*STAINLESS STEEL

AD-271 427 62-2-2 DIV. 26
NARMCO INDUSTRIES, INC., SAN DIEGO, CALIF.
DESCRIPTORS: (*STAINLESS STEEL, *NICKEL ALLOYS, CHROMIUM ALLOYS, COBALT ALLOYS, *BRAZING MATERIALS, CERAMIC MATERIALS, ADHESIVES, CHEMICAL REACTIONS, MANGANESE ALLOYS, NICKEL ALLOYS, BONDING, PROCESSING,)

AD-271 429 62-2-2 DIV. 17
NARMCO INDUSTRIES, INC., SAN DIEGO, CALIF.
DESCRIPTORS: (*STAINLESS STEEL, SHEETS, *SANDWICH PANELS, *HONEYCOMB CORES, BONDING, BONDED JOINTS, METAL JOINTS, BRAZING,) (*ADHESIVES, *METAL SEALS, SEALS, MATERIALS, CERAMIC MATERIALS, GLASS, COPPER ALLOYS, SILVER ALLOYS,) (HIGH TEMPERATURE RESEARCH, HIGH PRESSURE RESEARCH, PROCESSING, MECHANICAL PROPERTIES, TENSILE PROPERTIES,)

*STARS

AD-270 932 62-2-2 DIV. 2
RADIO OBSERVATORY, CALIF. INST. OF TECH., OWENS VALLEY, CALIF.
DESCRIPTORS: (*RADIO WAVES, *EXTRATERRESTRIAL RADIO WAVES, RADIO SIGNALS, SOURCES,) (*STARS, *GALAXIES, BRIGHTNESS, VISIBILITY, FOURIER ANALYSIS, SERIES,) *RADIO ASTRONOMY.

AD-271 091 62-2-2 DIV. 30
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*STARS, BRIGHTNESS, MEASUREMENT, *PHOTOMETERS, MOBILE,)

*STATIC DISCHARGERS

AD-271 432 62-2-2 DIV. 1
LIGHTNING AND TRANSIENTS RESEARCH INST., MINNEAPOLIS, MINN.
DESCRIPTORS: (AIRCRAFT, AIRPLANES, WINGS, ELECTRICAL CORONA, ELECTRIC FIELDS, STATIC ELECTRICITY, *STATIC DISCHARGERS, TEST METHODS, TEST EQUIPMENT,) DESIGN.

*STATISTICAL ANALYSIS

AD-270 959 62-2-2 DIV. 15
OPERATIONS ANALYSIS OFFICE, AIR FORCE, WASHINGTON, D. C.
DESCRIPTORS: (*OPERATIONS RESEARCH, GUIDED MISSILE RESEARCH, *STATISTICAL ANALYSIS, THEORY,) (GUIDED MISSILES, RESEARCH PROGRAM ADMINISTRATION,)

AD-271 045 62-2-2 DIV. 32
LOCKHEED MICROSYSTEMS ELECTRONICS, PALO ALTO, CALIF.
DESCRIPTORS: (ELECTRONIC EQUIPMENT, RELIABILITY, *STATISTICAL ANALYSIS, MATHEMATICAL PREDICTION, *TOPOLOGY, COSTS, ANALYSIS, ELECTRONIC SYSTEMS,)

AD-271 468 62-2-2 DIV. 22
NAVAL ORDNANCE LAB., WHITE OAK, MD.
DESCRIPTORS: (*UNDERWATER EXPLOSIONS, UNDERWATER EXPLOSION DAMAGE, EXPLOSION BUBBLES, GRAVITY, MODEL TESTS, STATISTICAL ANALYSIS,) SURFACE TENSION, VAPOR PRESSURE, VISCOSITY.

AD-271 516 62-2-2 DIV. 15
BROWN U. DIV. OF APPLIED MATHEMATICS, PROVIDENCE, R. I.
DESCRIPTORS: (*PROBABILITY, STATISTICAL PROCESSES, THEORY,) (INEQUALITIES, *STATISTICAL ANALYSIS, STATISTICAL FUNCTIONS, *STATISTICAL DISTRIBUTIONS, SERIES, SEQUENCES, INTEGRAL EQUATIONS, MATRIX ALGEBRA, DIFFERENTIAL EQUATIONS, FUNCTIONS, SPECIAL FUNCTIONS, HARMONIC ANALYSIS,)

AD-271 640 62-2-2 DIV. 30
WASHINGTON U., SEATTLE.
DESCRIPTORS: (*MACHINE TRANSLATION, *STATISTICAL ANALYSIS, DIGITAL COMPUTERS, PROGRAMMING,)

*STATISTICAL DISTRIBUTIONS

AD-271 430 62-2-2 DIV. 30
NAVAL ORDNANCE TEST STATION, CHINA LAKE, CALIF.
DESCRIPTORS: (INTEGRALS, *STATISTICAL DISTRIBUTIONS, STATISTICAL PROCESSES,) (PROBABILITY, MATHEMATICAL PREDICTION, BESSEL FUNCTIONS, IMPACT SHOCK, TABLES,) (GUIDED MISSILE RESEARCH, TARGET POSITION INDICATORS,)

AD-271 516 62-2-2 DIV. 15
BROWN U. DIV. OF APPLIED MATHEMATICS, PROVIDENCE, R. I.
DESCRIPTORS: (*PROBABILITY, STATISTICAL PROCESSES, THEORY,) (INEQUALITIES, *STATISTICAL ANALYSIS, STATISTICAL FUNCTIONS, *STATISTICAL DISTRIBUTIONS, SERIES, SEQUENCES, INTEGRAL EQUATIONS, MATRIX ALGEBRA, DIFFERENTIAL EQUATIONS, FUNCTIONS, SPECIAL FUNCTIONS, HARMONIC ANALYSIS,)

*STATISTICAL PROCESSES

AD-271 449 62-2-2 DIV. 15
SPACE TECHNOLOGY LABS., INC., LOS ANGELES, CALIF.
DESCRIPTORS: (STATISTICAL DISTRIBUTIONS, *STATISTICAL PROCESSES, STATISTICAL FUNCTIONS, PROBABILITY,)

*STEEL

AD-271 142 62-2-2 DIV. 17
WATERTOWN ARSENAL LABS., MASS.
DESCRIPTORS: (*STEEL, *TITANIUM ALLOYS, ALUMINUM ALLOYS, VANADIUM ALLOYS, TIN ALLOYS, AGING, HEAT TREATMENT, SHEETS, SANDWICH CONSTRUCTION, TEMPERATURE, LOW TEMPERATURE RESEARCH, HIGH TEMPERATURE RESEARCH, IMPACT SHOCK, THICKNESS, MECHANICAL PROPERTIES,) (TESTS, TEST METHODS,)

AD-271 379 62-2-2 DIV. 20
NAVAL RESEARCH LAB., WASHINGTON, D. C.
DESCRIPTORS: (*NUCLEAR POWER PLANTS, MATERIALS, *STEEL, *RADIATION EFFECTS, *RADIATION DAMAGE, MECHANICAL PROPERTIES, STRESSES, TEMPERATURE,)

AD-271 903 62-2-2 DIV. 17
ARMOUR RESEARCH FOUNDATION, CHICAGO, ILL.
DESCRIPTORS: (*STEEL, *NICKEL ALLOYS, *MOLYBDENUM ALLOYS, *TUNGSTEN ALLOYS,) (PROCESSING, HEAT TREATMENT, MELTING, INDUCTION HEATING, DEOXIDATION, SILICON, ALUMINUM, CARBON,) TESTS, MECHANICAL PROPERTIES, FATIGUE (MECHANICS), TENSILE PROPERTIES, ALLOYS.

AD-271 528 62-2-2 DIV. 17
DIRECTORATE OF MATERIALS AND PROCESSES, AERONAUTICAL SYSTEMS DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: (*STEEL, AIRFRAMES, *CADMIUM PLATING,) (PROCESSING, HEAT TREATMENT, AUSTENITE, ELECTROPLATING, CADMIUM COMPOUNDS, FLUORIDES, BORATES, DIFFUSION, NICKEL ALLOYS, CADMIUM ALLOYS, VAPOR PLATING, CADMIUM,) (TESTS, TENSILE PROPERTIES, STRESSES, FRACTURE (MECHANICS), FATIGUE (MECHANICS), IMPACT SHOCK, MICROSTRUCTURE, MECHANICAL PROPERTIES,) ALLOYS.

*STORAGE

AD-270 973 62-2-2 DIV. 10
LITTLE, ARTHUR D., INC., CAMBRIDGE, MASS.
DESCRIPTORS: (*LIQUID ROCKET PROPELLANTS, SATELLITE VEHICLES, SPACESHIPS, *STORAGE, PROPELLANT TANKS, THERMAL RADIATION, ATTENUATION, *THERMAL INSULATION, LAMINATES, FOILS ALUMINUM, GLASS TEXTILES, PLASTICS, THERMAL CONDUCTIVITY, HEAT TRANSFER, BOILING, MATHEMATICAL ANALYSIS,) (RADIATION EFFECTS, SHIELDING, FEASIBILITY STUDIES, THEORY,)

*STRESSES

AD-271 081 64-2-2 DIV. 17
AEROJET-GENERAL CORP., AZUSA, CALIF.
DESCRIPTORS: (*HEAT RESISTANT ALLOYS, STEEL, STAINLESS STEEL, TITANIUM ALLOYS, VANADIUM ALLOYS, CHROMIUM ALLOYS, *CORROSION, *STRESSES, FRACTURE (MECHANICS), FAILURE (MECHANICS),) (ROCKET CASES, MATERIALS, CORROSION INHIBITION, *CORROSION RESEARCH, CORROSIVE LIQUIDS, CORROSIVE GASES,) ALLOYS.

AD-271 108 64-2-2 DIV. 30
MIDWEST RESEARCH INST., KANSAS CITY, MO.
DESCRIPTORS: (*ULTRASONICS, *NON-DESTRUCTIVE TESTING, *METALS, *STRESSES, THERMAL STRESSES, PLASTIC FLOW, DEFORMATION, LATTICES, COMPRESSION SHOCK, VELOCITY, ATTENUATION, MEASUREMENT, ELASTICITY, ALUMINUM, STEEL,) TEST EQUIPMENT, STRAIN GAGES, TRANSDUCERS, PULSE GENERATORS, OSCILLOSCOPES.

AD-271 471 64-2-2 DIV. 25
BROWN U. DIV. OF APPLIED MATHEMATICS, PROVIDENCE, R. I.
DESCRIPTORS: (*CYLINDRICAL BODIES, ROTATION, ELASTICITY, *STRESSES, VISCOSITY,) (BOUNDARY LAYER, *FLUID FLOW, SURFACES,)

*STRONTIUM COMPOUNDS

AD-270 999 64-2-2 DIV. 25
RAYTHEON CO., BALTIMORE, MASS.
DESCRIPTORS: (*STRONTIUM COMPOUNDS, TITANATES, TEMPERATURE, *MICROWAVES, ABSORPTION, ATTENUATION,) *FERROELECTRIC MATERIALS.

*STRUCTURAL SHELLS

AD-270 969 64-2-2 DIV. 25
BROWN U. DIV. OF APPLIED MATHEMATICS, PROVIDENCE, R. I.
DESCRIPTORS: (*STRUCTURAL SHELLS, ELASTIC SHELLS, CYLINDRICAL BODIES, *LOAD DISTRIBUTION, LOADING,) (STRUCTURAL SHELLS, DEFORMATION, DEFLECTION, SOUND, ACOUSTICS, SHOCK WAVES,) (STRESSES, MATHEMATICAL ANALYSIS,)

*STYRENES

AD-270 956 64-2-2 DIV. 4
MELLON INST. OF INDUSTRIAL RESEARCH, PITTSBURGH, PA.
DESCRIPTORS: (*POLYMERS, *ETHYLENES, OXIDES, *STYRENES, CRYSTALS, CRYSTAL STRUCTURE, MOLECULAR WEIGHT, PHYSICAL PROPERTIES, VISCOSITY, MECHANICAL PROPERTIES, MOLECULAR STRUCTURE, STABILITY, SYNTHESIS, POLYMERIZATION, FREE RADICALS, IONS,) (TEST METHODS, TEST EQUIPMENT, TORSION METERS, X-RAY DIFFRACTION ANALYSIS,)

*SUBMARINE HULLS

AD-271 460 64-2-2 DIV. 31
J. G. ENGINEERING RESEARCH ASSOCIATES, BALTIMORE, MD.
DESCRIPTORS: (*SUBMARINE HULLS, VIBRATION, PRESSURE, *ACOUSTIC IMPEDANCE, THEORY,) (SHIP HULLS, SHIP MODELS, STRUCTURAL SHELLS, CYLINDRICAL BODIES, STRESSES, *HYDRODYNAMICS, ACOUSTICS, INTEGRAL EQUATIONS, FUNCTIONS, TRIGONOMETRY,)

*SUBMINIATURE ELECTRICAL EQUIPMENT

AD-270 944 64-2-2 DIV. 7
SPRAGUE ELECTRIC CO., NORTH ADAMS, MASS.
DESCRIPTORS: (*CERAMIC CAPACITORS, *SUBMINIATURE ELECTRICAL EQUIPMENT, MATERIALS, *MANUFACTURING METHODS, PRODUCTION,) (CAPACITORS, CERAMIC MATERIALS, POWDERS, DIELECTRICS, SPRAYS, COATINGS, BINDERS,)

*SULFIDES

AD-270 906 64-2-2 DIV. 25
HARVARD METALLURGICAL LAB., YALE U., NEW HAVEN, CONN.
DESCRIPTORS: (*LEAD COMPOUNDS, *SULFIDES, *SINGLE CRYSTALS, GROWTH, CHEMICAL IMPURITIES, DEFORMATION, PLASTICITY, DENSITY,) (FRACTURE (MECHANICS), REACTION KINETICS, STRESSES, PRISMS, POLARIZATION, MECHANICAL PROPERTIES,) MICROPHOTOGRAPHY.

*SUNSPOTS

AD-271 515 64-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*SUNSPOTS, HYDRODYNAMICS,) (SUNSPOTS, THEORY,) (IONOSPHERIC DISTURBANCES, SOLAR FLARES,) (*IONOSPHERE, IONIZATION,) (IONOSPHERE, TERRESTRIAL MAGNETISM,) (*AURORAE, ANTARCTIC REGIONS,) (AURORAE, MEASUREMENT, RADAR, PHOTOMETERS, SPECTROGRAPHIC ANALYSIS, PHOTOGRAPHIC ANALYSIS,) (*EARTH, *ELECTRIC CURRENTS,) SOLAR ATMOSPHERE, *COSMIC RAYS, *ATMOSPHERIC ELECTRICITY.

*SUPERAERODYNAMICS

AD-271 032 64-2-2 DIV. 9
FREE U. BERLIN (GERMANY).
DESCRIPTORS: (*SUPERAERODYNAMICS, GAS FLOW, SPHERES, *KINETIC THEORY,) (GASES, *HIGH TEMPERATURE RESEARCH,) (DISSOCIATION, SHOCK WAVES,) PARTIAL DIFFERENTIAL EQUATIONS.

*SUPERCONDUCTIVITY

AD-271 000 64-2-2 DIV. 25
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: (*CRYOGENICS, *LOW TEMPERATURE RESEARCH, *SUPERCONDUCTIVITY, THERMODYNAMICS, TRANSPORT PROPERTIES,) (ROCKET FUELS, LIQUID ROCKET PROPELLANTS, ROCKET OXIDIZERS, LIQUEFIED GASES, FLUORINE, HYDROGEN, OXYGEN, NITROGEN, OZONE,) (HAZARDS, HANDLING, STORAGE,) (GUIDED MISSILES, SURFACE TO SURFACE, SATELLITE VEHICLES,) (MATERIALS, ADHESIVES, SEALS, ELASTOMERS, LUBRICANTS, ALLOYS, ALUMINUM ALLOYS, COPPER ALLOYS, MAGNESIUM ALLOYS, MOLYBDENUM ALLOYS, NICKEL ALLOYS, STEEL, STAINLESS STEEL, TITANIUM ALLOYS,) (COMPUTERS, MEMORY DEVICES, DIGITAL COMPUTERS,) *BIBLIOGRAPHY, GYROSCOPES, INSTRUMENTATION.

*SUPERCONDUCTORS

AD-271 181 64-2-2 DIV. 25
ILLINOIS U., URBANA.
DESCRIPTORS: (*SUPERCONDUCTORS, SUPERCONDUCTIVITY,) (*QUANTUM STATISTICS, CALCULUS OF VARIATIONS, MATRIX ALGEBRA,) (*ELECTROMAGNETIC THEORY, PARTICLES, ELECTRONS, PHONONS, EXCITATION, RELAXATION TIME, PARAMAGNETIC CRYSTALS,) (EQUATIONS OF ENERGY AND MOTION, HARMONIC ANALYSIS,) SOLID STATE PHYSICS, THESES.

*SUPERSONIC FLOW

AD-270 922 64-2-2 DIV. 25
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
DESCRIPTORS: (*PLASMA PHYSICS, *PARTICLE ACCELERATORS, DESIGN, GASES, GAS FLOW, IONIZATION, *MAGNETOHYDRODYNAMICS, *SUPERSONIC FLOW,) (VELOCITY, MEASUREMENT,) (ARGON, MERCURY, VAPORS, ALTERNATING CURRENT, DIRECT CURRENT, PRESSURE, ELECTRIC ARCS, GLOW DISCHARGES, CATHODES,) (HIGH TEMPERATURE RESEARCH, ELECTROMAGNETIC FIELDS, THERMODYNAMICS, MAGNETIC FIELDS,)

AD-271 018 64-2-2 DIV. 9
BOEING SCIENTIFIC RESEARCH LABS., SEATTLE, WASH.
DESCRIPTORS: (*SUPERSONIC FLOW, WAVE ANALYSIS, *TRANSFORMATIONS (MATHEMATICS), SWEPT-FORWARD WINGS, *CONICAL BODIES,) (DIFFERENTIAL EQUATIONS, DIFFERENTIAL GEOMETRY, PARTIAL DIFFERENTIAL EQUATIONS,)

AD-271 048 64-2-2 DIV. 9
INSTITUTE OF ENGINEERING RESEARCH, U. OF CALIF., BERKELEY.
DESCRIPTORS: (*SUPERSONIC FLOW, *GAS IONIZATION, *FLUID MECHANICS, *PLASMA PHYSICS,) (DIFFUSION, PRESSURE, *BOUNDARY LAYER,) (SHOCK WAVES, IONS, DENSITY, TEMPERATURE, COOLING,) (WIND TUNNELS, ELECTRIC ARCS, HEATING,) DIFFERENTIAL EQUATIONS.

*SUPPLIES

AD-271 522 64-2-2 DIV. 26
APPLIED MATHEMATICS AND STATISTICS LABS., STANFORD U., CALIF.
DESCRIPTORS: (MONITORS, *DETERIORATION, STORAGE, *SUPPLIES, *CONTROL SYSTEMS,) (MANAGEMENT ENGINEERING, SUPPLY DEPOTS, TEMPERATURE, CORROSION, HUMIDITY, MAINTENANCE,)

*SWIMMING

AD-271 093 64-2-2 DIV. 31
DUNTLEY, S. U., LA JOLLA, CALIF.
DESCRIPTORS: (*NOMOGRAPHS, *VISIBILITY, *SWIMMING, MEASUREMENT,) (INSTRUMENTATION, *WATER, VISION, MATHEMATICAL ANALYSIS,) (*VISUAL PERCEPTION, SPACE PERCEPTION,)

*SWITCHING CIRCUITS

AD-271 064 64-2-2 DIV. 8
BOMAC LABS., INC., BEVERLY, MASS.
DESCRIPTORS: (*RADAR DUPLEXERS, *SWITCHING CIRCUITS, *TRANSMIT-RECEIVE TUBES, *ELECTRONIC SWITCHES, SINGLE CRYSTALS, BROADBAND, K BAND, DESIGN,)

AD-271 356 64-2-2 DIV. 8
RADIATION, INC., MELBOURNE, FLA.
DESCRIPTORS: (*PANEL BOARD (ELECTRICITY), ELECTRONIC EQUIPMENT, *SWITCHING CIRCUITS, NEGATIVE RESISTANCE CIRCUITS, ELECTRONIC CIRCUITS, IMPEDANCE, AUTOMATIC, DIODES, *ELECTRONIC SWITCHES, SOLID STATE PHYSICS, INTERFERENCE, DESIGN, MULTICHANNEL TELEPHONE SYSTEMS,)

AD-271 612 64-2-2 DIV. 5
MONTANA STATE COLL., BOZEMAN.
DESCRIPTORS: (*SWITCHING CIRCUITS, *COMMUNICATION SYSTEMS, STATISTICAL PROCESSES, GROUPS (MATHEMATICS), TRANSFORMATIONS (MATHEMATICS), SEQUENTIAL ANALYSIS, MATHEMATICAL LOGIC, ANALYSIS, SYNTHESIS, *COMBINATORIAL ANALYSIS, TRANSIENTS,)

*SYMPOSIA

AD-271 529 64-2-2 DIV. 9
AERONAUTICAL SYSTEMS DIV., AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: *SYMPOSIA, AIRFRAMES, STRUCTURES, *AERODYNAMIC HEATING, THERMODYNAMICS, DYNAMICS, AERODYNAMICS, *RE-ENTRY AERODYNAMICS, ELASTICITY, STABILITY, FLUTTER, LOAD DISTRIBUTION, HYPERSONICS, THERMAL STRESSES, HEAT TRANSFER, RE-ENTRY VEHICLES.

*TABLES

AD-271 029 64-2-2 DIV. 25
COLORADO U., BOULDER.
DESCRIPTORS: (*TABLES, *MICROWAVE SPECTROSCOPY, ROTATION, RESONANCE, FREQUENCY, CONTROL, MICROWAVES,) (ALGEBRA, THEORY, INTEGRAL EQUATIONS, MATRIX ALGEBRA, DIPOLE MOMENTS, *QUANTUM MECHANICS,)

*TANTALUM

AD-271 458 64-2-2 DIV. 17
METALS AND CERAMICS LABS., AERONAUTICAL SYSTEMS DIV., WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: (*TANTALUM, OXIDATION IN AIR AT TEMPERATURE, THERMAL STRESSES, LOADING, ENERGY, DETERMINATION, EQUATIONS,) (OXIDES X-RAY DIFFRACTION ANALYSIS,) (OXYGEN, DIFFUSION, SCALE,) STRESSES, METALS.

*TANTALUM ALLOYS

AD-270 955 64-2-2 DIV. 17
RAH CHANG CORP., ALBANY, OREG.
DESCRIPTORS: (*HEAT RESISTANT ALLOYS, *TANTALUM ALLOYS, NIOBIUM ALLOYS, VANADIUM ALLOYS, TUNGSTEN ALLOYS, *SHEETS, ROLLING MILLS, RELIABILITY, PRODUCTION, MANUFACTURING METHODS, POWDER METALLURGY, MELTING, PROCESSING, EXTRUSION, FORGING,) (PHYSICAL PROPERTIES, PHASE TRANSITIONS, THANSITION TEMPERATURE, STRESSES, RUPTURE, HEAT TREATMENT, DEFORMATION, TENSILE PROPERTIES, WELDING, OXIDATION, MACHINING,) AIRFRAMES, GUIDED MISSILES, SPACESHIPS.

*TEACHING MACHINES

AD-271 150 64-2-2 DIV. 23
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: *TEACHING MACHINES, *BIBLIOGRAPHY, *TRAINING DEVICES, *LEARNING, *EDUCATION, *MILITARY TRAINING.

*TELEMETER SYSTEMS

AD-271 124 64-2-2 DIV. 6
RADIATION, INC., MELBOURNE, FLA.
DESCRIPTORS: (*HANDBOOKS, *TELEMETER SYSTEMS, *TRANSDUCERS, PARTS CATALOGS,) BIBLIOGRAPHY, INDEXES.

*TELEMETERING ANTENNAS

AD-271 518 64-2-2 DIV. 5
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON, D. C.
DESCRIPTORS: (*SATELLITE VEHICLE ANTENNAS, *TELEMETERING ANTENNAS, ANTENNAS, DESIGN,) (SATELLITE VEHICLES, SPACESHIPS, SPHERES, COMMUNICATIONS SYSTEMS,)

*TELEPHONE COMMUNICATION SYSTEMS

AD-271 587 64-2-2 DIV. 25
NAVAL ORDNANCE LAB., CORONA, CALIF.
DESCRIPTORS: (*TELEPHONE COMMUNICATION SYSTEMS, PANEL BOARDS (ELECTRICITY), NOISE GENERATORS, THEORY, DESIGN,) (*FERROMAGNETISM, *IRON ALLOYS, *NICKEL ALLOYS, FILMS,) (*RARE GASES, INFRARED SPECTROSCOPY, INTERFEROMETERS, ELECTROMAGNETIC WAVES, WAVE TRANSMISSION,) (*SEMICONDUCTORS, *SILICON, MAGNETO-OPTIC ROTATION,) (*HEAT RESISTANT POLYMERS, *POLYMERS, *PHOSPHINES, PHENYL RADICALS, CHLORIDES, SYNTHESIS, CHEMICAL REACTIONS,) (SOLID STATE PHYSICS, *MICROWAVE OSCILLATORS, *DIODES, *RARE EARTH COMPOUNDS, CALCIUM COMPOUNDS, FLUORIDES, *THULIUM COMPOUNDS, SPECTROPHOTOMETERS, ABSORPTION, FLUORESCENCE, CRYSTALS,) (*GUIDED MISSILE ANTENNAS, *SLOT ANTENNAS, *WAVEGUIDE SLOTS, DIELECTRICS, ANTENNA RADIATION PATTERNS, MEASUREMENT,)

*TELEVISION GUIDANCE

AD-270 936 64-2-2 DIV. 12
GENERAL DYNAMICS/CONVAIR, SAN DIEGO, CALIF.
DESCRIPTORS: (*GUIDED BOMBS, GUIDED MISSILES, AIR-TO-SURFACE, *TELEVISION GUIDANCE, VELOCITY, MANEUVERABILITY, TARGET RECOGNITIONS, SURFACE TARGETS, INTERCEPTION PROBABILITY, TERMINAL BALLISTICS, SIMULATION, MATHEMATICAL PREDICTION,)

*TEMPERATURE CONTROL

AD-271 413 64-2-2 DIV. 8
*WHIRLPOOL CORP., ST. JOSEPH, MICH.
DESCRIPTORS: (*CRYSTAL OVENS, RADIOFREQUENCY, FREQUENCY, STANDARDS, FREQUENCY STABILIZERS, *THERMOELECTRICITY, *TEMPERATURE CONTROL, HEAT EXCHANGERS, CRYSTALS, DESIGN, INSTALLATION, TESTS.)

*TERMINAL BALLISTICS

AD-271 919 64-2-2 DIV. 9
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, *WASHINGTON, D. C.
DESCRIPTORS: (*HYPERVELOCITY GUNS, HYPERVELOCITY PROJECTILES, LAUNCHING, SIMULATION.) (*TERMINAL BALLISTICS, GAS DISCHARGES.)

*TEST EQUIPMENT

AD-271 477 64-2-2 DIV. 28
NORTHROP CORP., HAWTHORNE, CALIF.
DESCRIPTORS: (*HUMAN ENGINEERING, *MAINTENANCE, *AIRCRAFT EQUIPMENT, ELECTRICAL EQUIPMENT, DESIGN, INDEXES.) (*ANTHROPOMETRY, TEST EQUIPMENT.) (AUTOMATIC, *TEST EQUIPMENT, MONITORS, TEST SETS,) HANDBOOKS.

*TEST REACTORS

AD-271 611 64-2-2 DIV. 20
CORNELL U., ITHACA, N. Y.
DESCRIPTORS: (*TEST REACTORS, *POWER REACTORS, DESIGN.) (REACTOR CORES, CONTROL RODS,)

*TETRODES

AD-271 619 64-2-2 DIV. 8
RADIO CORP. OF AMERICA, LANCASTER, PA.
DESCRIPTORS: (*TETRODES, *POWER AMPLIFIERS, RADIOFREQUENCY POWER, VERY HIGH FREQUENCY.) (CIRCUITS, DESIGN, VERY HIGH FREQUENCY.) *IMPEDANCE MATCHING.

*THERMAL CONDUCTIVITY

AD-271 102 64-2-2 DIV. 25
GEORGIA INST. OF TECH. ENGINEERING EXPERIMENT STATION, ATLANTA.
DESCRIPTORS: (*THERMAL CONDUCTIVITY, PARTICLES, *COLLOIDS, EXPERIMENTAL DATA.) (COLLOIDS, GELS.) (GREASES, ZINC, ALUMINUM.)

*THERMAL INSULATION

AD-271 112 64-2-2 DIV. 12
NAVAL ORDNANCE LAB., WHITE OAK, MD.
DESCRIPTORS: (HIGH TEMPERATURE RESEARCH, TEST EQUIPMENT, TEST METHODS, *THERMAL INSULATION, HEAT, *INSULATING MATERIALS, HEAT RESISTANT POLYMERS, REFRACTORY MATERIALS, *ABLATION, *GUIDED MISSILES, *RE-ENTRY VEHICLES, *POCKET CASES, *ROCKET MOTOR NOZZLES,) (MEASUREMENT, TEMPERATURE, THERMAL DIFFUSION, MATHEMATICAL ANALYSIS.) (OXYGEN, ACETYLENES, WELDING, FLAMES.)

AD-271 462 64-2-2 DIV. 14
FOREST PRODUCTS LAB., MADISON, WIS.
DESCRIPTORS: (*THERMAL RADIATION, NUCLEAR EXPLOSIONS, ATOMIC BOMB EXPLOSIONS, *THERMAL INSULATION, *GLASS, COMBUSTION, INHIBITION, TEXTILES, PAPER, MATERIALS, TEST METHODS.)

*THERMAL RADIATION

AD-270 948 64-2-2 DIV. 16
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
DESCRIPTORS: (*THERMAL RADIATION, GAS FLOW, AIR, *SKIN, *BURNS, PROTECTIVE CLOTHING, CLOTHING, *COTTON TEXTILES, HEAT TRANSFER, RADIATION EFFECTS,) (TEST METHODS, TEST EQUIPMENT, CARBON ARC LAMPS, SKIN, SIMULATION, PLASTICS.)

AD-270 949 64-2-2 DIV. 14
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
DESCRIPTORS: (*THERMAL RADIATION, RADIATION EFFECTS, ATOMIC BOMB EXPLOSIONS, NUCLEAR EXPLOSIONS, HEAT, TRANSMISSION, *GLASS, COATINGS, PROTECTIVE COVERINGS, *ALUMINUM, SHEETS, *WIRE SCREENS,) (TEST METHODS, TEST EQUIPMENT, SPECTROPHOTOMETERS, INDICATOR PAPERS,)

AD-270 950 64-2-2 DIV. 25
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
DESCRIPTORS: (*THERMAL RADIATION, PRODUCTION, *RADIATION EFFECTS, MATERIALS, BIBLIOGRAPHY,) (SKIN, SIMULATION, TESTS.) LABORATORY EQUIPMENT.

AD-270 951 64-2-2 DIV. 14
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
DESCRIPTORS: (*RADIATION EFFECTS, *THERMAL RADIATION, SOURCES, MATERIALS, PAINTS, COATINGS, TEXTILES, PLASTICS, CERAMIC MATERIALS, ASPHALT, FUELS,) (*SKIN, SIMULATION, POLYMERS, ETHYLENES, BURNS, REFLECTION,) (TEST METHODS, TEST EQUIPMENT, INCANDESCENT LAMPS TUNGSTEN.)

AD-270 952 64-2-2 DIV. 25
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
DESCRIPTORS: (*INFRARED PULSES, *THERMAL RADIATION, ATOMIC BOMB EXPLOSIONS, SIMULATION, GENERATORS, DESIGN,)

AD-271 462 64-2-2 DIV. 14
FOREST PRODUCTS LAB., MADISON, WIS.
DESCRIPTORS: (*THERMAL RADIATION, NUCLEAR EXPLOSIONS, ATOMIC BOMB EXPLOSIONS, *THERMAL INSULATION, *GLASS, COMBUSTION, INHIBITION, TEXTILES, PAPER, MATERIALS, TEST METHODS,)

*THERMIONIC EMISSION

AD-271 101 64-2-2 DIV. 8
GENERAL TELEPHONE AND ELECTRONICS LABS., INC., BAYSIDE, N. Y.
DESCRIPTORS: (CATHODES (ELECTRON TUBES), *OXIDE CATHODES, DIODES, NICKEL, MATERIALS, *THERMIONIC EMISSION,) (OXIDE CATHODES, SUBLIMATION, MEASUREMENT,) (EVAPORATION, THIN FILMS, BARIUM, BARIUM COMPOUNDS, OXIDES, PLATINUM, NICKEL, TANTALUM,) (TUNGSTEN, ALUMINUM COMPOUNDS, OXIDES, CHEMICAL REACTIONS TEMPERATURE,) MAGNETISM, POLARIZATION, MASS SPECTROSCOPY.

*THERMOCHEMISTRY

AD-271 363 64-2-2 DIV. 30
LUND U. (SWEDEN).
DESCRIPTORS: (*PHOTOLYSIS, ORGANIC SOLVENTS, METHYL RADICALS, PENTANES, CARBON COMPOUNDS, SULFIDES, ETHYL RADICALS, IODIDES,) (*SPECTROPHOTOMETERS, DESIGN, LOW TEMPERATURE RESEARCH, *THERMOCHEMISTRY, *CHEMICAL BONDS, *RECOMBIATION REACTIONS, *FREE RADICALS,) SWEDEN.

*THERMOCOUPLES

AD-271 416 64-2-2 DIV. 27
GENERAL ELECTRIC CO., *EAST LYNN, MASS.
DESCRIPTORS: (*THERMOCOUPLES, DESIGN, RECORDING DEVICES FOR MEASUREMENT OF *JET ENGINES, TURBOJET ENGINES, AGING,) (ELECTRICAL CONDUCTANCE ON THERMAL DIFFUSION, METAL FILMS IN EXHAUST GASES,) (BONDING, THIN FILMS OF CHROMIUM, IRON, PALLADIUM, PLATINUM, GOLD, SILVER, TESTS, PREPARATION, MANUFACTURING METHODS,)

*THERMOELECTRICITY

AD-271 413 64-2-2 DIV. 8
*WHIRLPOOL CORP., ST. JOSEPH, MICH.
DESCRIPTORS: (*CRYSTAL OVENS, RADIOFREQUENCY, FREQUENCY, STANDARDS, FREQUENCY STABILIZERS, *THERMOELECTRICITY, *TEMPERATURE CONTROL, HEAT EXCHANGERS, CRYSTALS, DESIGN, INSTALLATION, TESTS,)

*THIN FILMS

AD-271 046 64-2-2 DIV. 8
LOCKHEED MICROSYSTEMS ELECTRONICS, SUNNYVALE, CALIF.
DESCRIPTORS: (*INTERMEDIATE FREQUENCY AMPLIFIERS, *ELECTRONIC CIRCUITS, *THIN FILMS, ELECTRODES, *ELECTROSTATIC CAPACITANCE, DIELECTRICS,) (THIN FILMS, THICKNESS, RESISTANCE, ELECTROSTATIC CAPACITANCE, TEMPERATURE, DIELECTRIC PROPERTIES,)

AD-271 633 64-2-2 DIV. 25
SYLVANIA ELECTRIC PRODUCTS, INC., *OBURN, MASS.
DESCRIPTORS: (*DIODES, SILICON COMPOUNDS, SILANES, CHLORIDES, DIFFUSION, VAPORS, DEPOSITS, *THIN FILMS, TEMPERATURE, *SILICON, CRYSTALS, *SINGLE CRYSTALS, GROWTH, THICKNESS, RESISTANCE,) (CHEMICAL IMPURITIES, PHOSPHORUS, BORON COMPOUNDS, BROMIDES,) GASES, ARGON.

AD-271 645 64-2-2 DIV. 8
ARMOUR RESEARCH FOUNDATION, CHICAGO, ILL.
DESCRIPTORS: (SEMICONDUCTORS, *THIN FILMS, *SEMICONDUCTING FILMS, *DIELECTRIC FILMS, *METAL FILMS, MANUFACTURING METHODS, CONDUCTIVITY, HALL EFFECT, DIELECTRIC PROPERTIES, ELECTRICAL PROPERTIES, CRYSTAL STRUCTURE, X-RAY DIFFRACTION ANALYSIS,) (METALLIC SMOKE DEPOSITS, SURFACES, METALS, LIQUID METALS,) (SILICON COMPOUNDS, TITANIUM COMPOUNDS, DIOXIDES, CARBIDES, BORIDES, BORON, BORON COMPOUNDS, PHOSPHIDES, MERCURY COMPOUNDS, SELENIDES, TELLURIDES, TITANIUM ALLOYS, COPPER ALLOYS, BONDING, ANTIOXIDANTS,)

*TIN COMPOUNDS

AD-271 005 64-2-2 DIV. 7
PENNSYLVANIA STATE U. MINERAL INDUSTRIES EXPERIMENT STATION, UNIVERSITY PARK.
DESCRIPTORS: (*FUEL CELLS, OXIDATION-REDUCTION REACTIONS, *TIN COMPOUNDS, CHLORIDES, HYDROCHLORIC ACID, FORMALDEHYDE, HEATING,) (MASS SPECTROSCOPY, QUANTITATIVE ANALYSIS, GASES, CARBON DIOXIDE, METHANES, CARBON COMPOUNDS, OXIDES,) *POWER SUPPLIES, ELECTROCHEMISTRY.

*TISSUES (BIOLOGY)

AD-271 593 64-2-2 DIV. 16
AEROSPACE MEDICAL DIV., *WRIGHT AIR DEVELOPMENT DIV., *WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: (*BRAIN, *TISSUES (BIOLOGY), *METALS, *TRANSPLANTATION, HISTOLOGICAL SECTIONS, PATHOLOGY, AS RATORYSANIMALS,) RADIOGRAPHIC ANALYSIS.

*TITANIUM ALLOYS

AD-270 976 64-2-2 DIV. 17
REPUBLIC AVIATION CORP., FARMINGDALE, N. Y.
DESCRIPTORS: (AIRFRAMES, MATERIALS, *TITANIUM ALLOYS, ALUMINUM ALLOYS, MOLYBDENUM ALLOYS, *EXTRUSION, MANUFACTURING METHODS, PROCESSING, DIES, CERAMIC COATINGS, GLASS, LUBRICATION, METAL FORMING PRESSES,) (COATINGS, OXYGEN, CHEMICAL REACTIONS, CONTAMINATION ON HEAT TREATMENT,) (MECHANICAL PROPERTIES, TENSILE PROPERTIES, SURFACE PROPERTIES, HARDNESS, MICROSTRUCTURE,)

AD-271 009 64-2-2 DIV. 25
SYRACUSE U., N. Y.
DESCRIPTORS: (*FRACTURE (MECHANICS), *METALS, *ALLOYS, *TITANIUM ALLOYS, ALUMINUM ALLOYS, VANADIUM ALLOYS, STRESSES, DEFORMATION, PROPAGATION, GRAINS (METALLURGY), METALLURGICAL ANALYSIS, THEORY,)

AD-271 142 64-2-2 DIV. 17
WATERTOWN ARSENAL LABS., MASS.
DESCRIPTORS: (*STEEL, *TITANIUM ALLOYS, ALUMINUM ALLOYS, VANADIUM ALLOYS, TIN ALLOYS, AGING, HEAT TREATMENT, SHEETS, SANDWICH CONSTRUCTION, TEMPERATURE, LOW TEMPERATURE RESEARCH, HIGH TEMPERATURE RESEARCH, IMPACT SHOCK, THICKNESS, MECHANICAL PROPERTIES,) (TESTS, TEST METHODS,)

AD-271 412 64-2-2 DIV. 17
TITANIUM METALS CORP. OF AMERICA, TORONTO, OHIO.
DESCRIPTORS: (*METAL PLATES, *TITANIUM ALLOYS, VANADIUM ALLOYS, CHROMIUM ALLOYS, ALUMINUM ALLOYS, WELDING, ARC WELDING, GASES, ARGON, HELIUM,) (WELDING RODS, WELDED JOINTS, WELDS, MECHANICAL PROPERTIES, TENSILE PROPERTIES, DEFORMATION, IMPACT SHOCK, CREEP, HARDNESS, MICROSTRUCTURE, FRACTURE (MECHANICS),) CHEMICAL ANALYSIS, MICROPHOTOGRAPHY, MANUFACTURING METHODS, PRODUCTION.

AD-271 526 64-2-2 DIV. 17
METALS AND CERAMICS LAB., AERONAUTICAL SYSTEMS DIV., *WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: (*TITANIUM ALLOYS FOR *FORGING,) (TESTS, MECHANICAL PROPERTIES, TENSILE PROPERTIES, ELASTICITY, SHEAR STRESSES, THERMAL STRESSES, STABILITY, IMPACT SHOCK, FRACTURE MECHANICS,) TORSION METERS, HIGH TEMPERATURE RESEARCH, LOW TEMPERATURE RESEARCH,) (MECHANICAL PROPERTIES, TABLES,) ALLOYS.

AD-271 608 64-2-2 DIV. 17
BATTELLE MEMORIAL INST., COLUMBUS, OHIO.
DESCRIPTORS: (*TITANIUM ALLOYS, ALUMINUM ALLOYS, HAFNIUM ALLOYS, ZIRCONIUM ALLOYS, VANADIUM ALLOYS, CHROMIUM ALLOYS, NIOBIUM ALLOYS, TUNGSTEN ALLOYS, AGING, HARDNESS, HEAT TREATMENT, MICROSTRUCTURE, MECHANICAL PROPERTIES, PHASE STUDIES, PHASE TRANSITIONS, TENSILE PROPERTIES, IMPACT SHOCK,) TESTS, ALLOYS.

*TOPOLOGY

AD-271 045 64-2-2 DIV. 32
LOCKHEED MICROSYSTEMS ELECTRONICS, PALO ALTO, CALIF.
DESCRIPTORS: (ELECTRONIC EQUIPMENT, RELIABILITY, *STATISTICAL ANALYSIS, MATHEMATICAL PREDICTION, *TOPOLOGY, COSTS, ANALYSIS, ELECTRONIC SYSTEMS,)

*TORQUE

AD-271 617 64-2-2 DIV. 25
MANHATTAN COLL., NEW YORK.
DESCRIPTORS: (VIBRATION, *TORQUE, *SHAFTS, DAMPING,) (INTERNAL COMBUSTION ENGINES, GENERATORS,) NUMERICAL METHODS AND PROCEDURES.

*TRAINING

AD-271 483 64-2-2 DIV. 23
PSYCHOLOGICAL RESEARCH ASSOCIATES, INC., ARLINGTON, VA.
DESCRIPTORS: (*TRAINING, *MILITARY TRAINING, *SELECTION OF TRAINING DEVICES, EFFECTIVENESS,) (*JOB ANALYSIS, AVIATION PERSONNEL,)

*TRAINING DEVICES

AD-271 150 64-2-2 DIV. 23
ARMED SERVICES TECHNICAL INFORMATION AGENCY, ARLINGTON, VA.
DESCRIPTORS: *TEACHING MACHINES, *BIBLIOGRAPHY, *TRAINING DEVICES, *LEARNING, *EDUCATION, *MILITARY TRAINING.

*TRANSDUCERS

AD-270 958 64-2-2 DIV. 30
PARAMETRICS, INC., SAXONVILLE, MASS.
DESCRIPTORS: (*PRESSURE GAGES, *TRANSDUCERS,

PHOTOELECTRIC CELLS; ELECTRODES; PHOTOCONDUCTIVITY; LUMINESCENCE; PHOSPHORS; DIELECTRIC PROPERTIES; CRYSTALS; DESIGN; MATHEMATICAL ANALYSIS.)

AD-271 124 62-2-2 DIV. 6
RADIATION, INC., MELBOURNE, FLA.
DESCRIPTORS: (*HANDBOOKS, *TELEMETER SYSTEMS, *TRANSDUCERS, PARTS CATALOGS.) BIBLIOGRAPHY, INDEXES.

*TRANSFORMATIONS (MATHEMATICS)

AD-271 018 62-2-2 DIV. 9
BOEING SCIENTIFIC RESEARCH LABS., SEATTLE, WASH.
DESCRIPTORS: (*SUPERSONIC FLOW, WAVE ANALYSIS, *TRANSFORMATIONS (MATHEMATICS), SWEPT-FORWARD WINGS, *CONICAL BODIES.) (DIFFERENTIAL EQUATIONS, DIFFERENTIAL GEOMETRY, PARTIAL DIFFERENTIAL EQUATIONS.)

*TRANSISTOR AMPLIFIERS

AD-271 074 62-2-2 DIV. 8
ANTI-SUBMARINE WARFARE LAB., NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA.
DESCRIPTORS: (*DIODES, *TRANSISTORS, PREAMPLIFIERS, *RADIO RECEIVERS, *TRANSISTOR AMPLIFIERS, SEMICONDUCTORS, AMPLITUDE MODULATION, FREQUENCY MODULATION, AIRBORNE, VERY HIGH FREQUENCY, *RADIO SONO BUOYS, THEORY, DESIGN.) (CIRCUITS, ELECTRONIC CIRCUITS, APPLIFIERS.)

*TRANSISTORS

AD-271 074 62-2-2 DIV. 8
ANTI-SUBMARINE WARFARE LAB., NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA.
DESCRIPTORS: (*DIODES, *TRANSISTORS, PREAMPLIFIERS, *RADIO RECEIVERS, *TRANSISTOR AMPLIFIERS, SEMICONDUCTORS, AMPLITUDE MODULATION, FREQUENCY MODULATION, AIRBORNE, VERY HIGH FREQUENCY, *RADIO SONO BUOYS, THEORY, DESIGN.) (CIRCUITS, ELECTRONIC CIRCUITS, AMPLIFIERS.)

AD-271 458 62-2-2 DIV. 8
LANSDALE DIV., PHILCO CORP., PA.
DESCRIPTORS: (*TRANSISTORS, MANUFACTURING METHODS, PRODUCTION, DESIGN.) (SILICON, *SINGLE CRYSTALS, SERVO SYSTEMS, ELECTRODES, ELECTROPLATING, SOLDERING, ATTACHMENT.)

*TRANSMIT-RECEIVE TUBES

AD-271 064 62-2-2 DIV. 8
BOMAC LABS., INC., BEVERLY, MASS.
DESCRIPTORS: (*RADAR DUPLEXERS, *SWITCHING CIRCUITS, *TRANSMIT-RECEIVE TUBES, *ELECTRONIC SWITCHES, SINGLE CRYSTALS, BROADBAND, K BAND, DESIGN.)

*TRANSPLANTATION

AD-271 593 62-2-2 DIV. 16
AEROSPACE MEDICAL DIV., *WRIGHT AIR DEVELOPMENT DIV., *WRIGHT-PATTERSON AIR FORCE BASE, OHIO.
DESCRIPTORS: (*BRAIN, *TISSUES (BIOLOGY), *METALS, *TRANSPLANTATION, HISTOLOGICAN SECTIONS, PATHOLOGY, AB RATORYSANIMALS.) RASIOGRAPHIC ANALYSIS.

*TRAVELING WAVE TUBES

AD-271 054 62-2-2 DIV. 8
WATKINS-JOHNSON CO., PALO ALTO, CALIF.
DESCRIPTORS: (*TRAVELING WAVE TUBES, *MICROWAVE AMPLIFIERS, EXTREMELY HIGH FREQUENCY, BROADBAND, NOISE (RADIO), REDUCTION, DESIGN.) (ELECTRON TUBES, CATHODES (ELECTRON TUBES), HELIXES, WAVEGUIDE WINDOWS, MICA, STANDING WAVE RATIOS, MAGNETS, ELECTRON BEAMS, FOCUSING, ELECTRON GUNS.) (ANTENNAS, PROCESSING, TESTS.)

AD-271 482 62-2-2 DIV. 8
MICROWAVE LAB., GENERAL ELECTRIC CO., PALO ALO, CALIF.
DESCRIPTORS: (*TRAVELING WAVE TUBES, X BAND, *MICROWAVE AMPLIFIERS, BROADBAND.) (AMPLIFIERS, ELECTRON TUBES, ELECTRON GUNS, HELIXES, ELECTRONIC CIRCUITS, FOCUSING, MATERIALS, METALS, CERAMIC MATERIALS.)

*TUNGSTEN

AD-271 436 62-2-2 DIV. 27
ROLLA METALLURGY RESEARCH CENTER, BUREAU OF MINES, MO.
DESCRIPTORS: (*ROCKET MOTOR NOZZLES, COATINGS, *VAPOR PLATING, *TUNGSTEN, TUNGSTEN COMPOUNDS, BERYLLIUM COMPOUNDS, OXIDES, CRYSTALLIZATION.)

AD-271 551 62-2-2 DIV. 26
HAMILTON STANDARD DIV., UNITED AIRCRAFT CORP., WINDSOR LOCKS, CONN.
DESCRIPTORS: (*TUNGSTEN, *MOLYBDENUM ALLOYS, SHEETS, *ELECTRIC WELDING, WELDING, ELECTRON BEAMS.) (WELDS, WELDED JOINTS, RADIOGRAPHIC ANALYSIS, METALLURGICAL ANALYSIS, MECHANICAL PROPERTIES, TENSILE PROPERTIES, SURFACE PROPERTIES, DEFORMATION, FRACTURE (MECHANICS), POROSITY, GRAINS (METALLURGY), MELTING, CRYSTALLIZATION.) (MACHINING, ELECTROEROSIVE MACHINING, PROCESSING.) METALS, ALLOYS.

*TUNGSTEN ALLOYS

AD-271 903 62-2-2 DIV. 17
ARMCUR RESEARCH FOUNDATION, CHICAGO, ILL.
DESCRIPTORS: (*STEEL, *NICKEL ALLOYS, *MOLYBDENUM ALLOYS, *TUNGSTEN ALLOYS.) (PROCESSING, HEAT TREATMENT, MELTING, INDUCTION HEATING, DEOXIDATION, SILICON, ALUMINUM, CARBON.) TESTS, MECHANICAL PROPERTIES, FATIGUE (MECHANICS), TENSILE PROPERTIES, ALLOYS.

*TURBULENCE

AD-271 082 62-2-2 DIV. 12
ARMY SIGNAL MISSILE SUPPORT AGENCY, WHITE SANS MISSILE RANGE, N. MEX.
DESCRIPTORS: (*GUIDED MISSILES, SURFACE TO SURFACE, LAUNCHING, LAUNCHING SITES, METEOROLOGICAL DATA, *WIND, *TURBULENCE, *GUIDED MISSILE TRAJECTORIES, DRIFT, MATHEMATICAL PREDICTION, MEASUREMENT, TAYLOR'S SERIES, STATISTICAL FUNCTIONS.)

*TURBULENT BOUNDARY LAYER

AD-271 568 62-2-2 DIV. 9
MISSISSIPPI U., UNIVERSITY.
DESCRIPTORS: (BODIES OF REVOLUTION, CONICAL BODIES, CONVEX BODIES, AIRFOILS, *RING WINGS, LAMINAR BOUNDARY LAYER, *TURBULENT BOUNDARY LAYER, SEPARATION, *TURBULENT FLOW, PRESSURE, MATHEMATICAL ANALYSIS.)

*TURBULENT FLOW

AD-271 175 62-2-2 DIV. 9
STANFORD U., CALIF.
DESCRIPTORS: (SHEETS, *LAMINAR BOUNDARY LAYER, TRANSITION TEMPERATURE, CONFIGURATION, GAS FLOW, WEDGES, SEPARATION.) (*TURBULENT FLO, FRICTION, SMOKES, DYES, OSCILLATIONS.) (MECHANICS, THEORY, HYDRODYNAMICS, STABILITY, ANEMOMETERS, NON-LINEAR SYSTEMS, FEASIBILITY STUDIES, MEASUREMENT.)

AD-271 568 62-2-2 DIV. 9
MISSISSIPPI U., UNIVERSITY.
DESCRIPTORS: (BODIES OF REVOLUTION, CONICAL BODIES, CONVEX BODIES, AIRFOILS, *RING WINGS, LAMINAR BOUNDARY LAYER, *TURBULENT BOUNDARY LAYER, SEPARATION, *TURBULENT FLOW, PRESSURE, MATHEMATICAL ANALYSIS.)

*ULTRASONICS

AD-271 067 62-2-2 DIV. 25
METALS RESEARCH LAB., BROWN U., PROVIDENCE, R. I.
DESCRIPTORS: (ALUMINUM ALLOYS, *FATIGUE (MECHANICS), *ULTRASONICS, ULTRASONIC PROPERTIES, ATTENUATION, VELOCITY, MEASUREMENT,) (STRESSES, SURFACES, SIMULATION, MICROSCOPY, ELECTRON MICROSCOPY, TEST METHODS, TEST EQUIPMENT,) LATTICES, DEFORMATION, ALLOYS.

AD-271 108 62-2-2 DIV. 30
MIDWEST RESEARCH INST., KANSAS CITY, MO.
DESCRIPTORS: (*ULTRASONICS, *NON-DESTRUCTIVE TESTING, *METALS, *STRESSES, THERMAL STRESSES, PLASTIC FLOW, DEFORMATION, LATTICES, COMPRESSION SHOCK, VELOCITY, ATTENUATION, MEASUREMENT, ELASTICITY, ALUMINUM, STEEL,) TEST EQUIPMENT, STRAIN GAGES, TRANSDUCERS, PULSE GENERATORS, OSCILLOSCOPES.

AD-271 143 62-2-2 DIV. 17
WATERTOWN ARSENAL LABS., MASS.
DESCRIPTORS: (METALS, *NON-DESTRUCTIVE TESTING, *ULTRASONICS, ATTENUATION, FREQUENCY, EFFECTIVENESS, TEST METHODS,) (ALUMINUM, GRAINS (METALLURGY), MICROSTRUCTURE,)

AD-271 377 62-2-2 DIV. 26
AEROPROJECTS, INC., WEST CHESTER, PA.
DESCRIPTORS: (*REFRACTORY MATERIALS, *HEAT RESISTANT ALLOYS, *ULTRASONICS, *WELDING, SHEETS,) (MOLYBDENUM ALLOYS, TITANIUM ALLOYS, NIOBIUM, TUNGSTEN, ALUMINUM, STANDING WAVE RATIOS, FOILS, TITANIUM, TANTALUM,) (WELDS, MECHANICAL PROPERTIES, TENSILE PROPERTIES, SHEAR STRESSES, DEFORMATION, FRACTURE (MECHANICS),)

*ULTRAVIOLET SPECTROPHOTOMETERS

AD-271 562 62-2-2 DIV. 30
LUND U. (SWEDEN).
DESCRIPTORS: (*SPECTROPHOTOMETERS, *ULTRAVIOLET SPECTROPHOTOMETERS, DESIGN, MATERIAL, QUARTZ, LOW TEMPERATURE RESEARCH,) SWEDEN.

*UNDERWATER

AD-271 092 62-2-2 DIV. 30
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*UNDERWATER, *LIGHT, MEASUREMENT, *PHOTOMETERS,)

AD-271 488 62-2-2 DIV. 22
NAVAL ORDNANCE LAB., WHITE OAK, MD.
DESCRIPTORS: (*UNDERWATER EXPLOSIONS, UNDERWATER EXPLOSION DAMAGE, EXPLOSION BUBBLES, GRAVITY, MODEL TESTS, STATISTICAL ANALYSIS,) SURFACE TENSION, VAPOR PRESSURE, VISCOSITY.

*UPPER ATMOSPHERE

AD-271 648 62-2-2 DIV. 25
QUEEN'S U., BELFAST (ST. BRIT.).
DESCRIPTORS: (*UPPER ATMOSPHERE, *PHYSICS, SCIENTIFIC RESEARCH,) GREAT BRITAIN.

*URETHANES

AD-271 567 62-2-2 DIV. 8
PLASTICS RESEARCH LAB., MASS. INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*RADOMES, MATERIALS, BRITTLE MATERIALS, *EXPANDED PLASTICS, POLYMERS, *URETHANES,) (DENSITY, TENSILE PROPERTIES, MECHANICAL PROPERTIES, PRODUCTION, QUALITY CONTROL, FAILURE (MECHANICS), FRACTURE (MECHANICS), WELDED JOINTS, BONDED JOINTS, DESIGN, RELIABILITY,) (TESTS, TEST METHODS,)

*USSR

AD-271 514 62-2-2 DIV. 16
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*LITERATURE, *USSR, *SPACE MEDICINE, *SPACE FLIGHT, BIOLOGY, RADIOBIOLOGY, SURVIVAL, HYPERTHERMIA, BLOOD,)

*VAN ALLEN RADIATION BELT

AD-271 512 62-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*IONOSPHERE, IONIZATION,) (*AURORAE, NIGHT SKY, LUMINESCENCE,) (*SOLAR CORONA, SOLAR FLARES, POLARIZATION,) VAN ALLEN RADIATION BELT, *COSMIC RAYS, *ATMOSPHERIC ELECTRICITY, *PLASMA PHYSICS.

*VANADATES

AD-271 451 62-2-2 DIV. 4
INORGANIC RESEARCH LAB., WESTERN RESERVE U., CLEVELAND, OHIO.
DESCRIPTORS: (*METALORGANIC COMPOUNDS, ESTERS, PHENYL RADICALS, *SILICONES, THIO RADICALS, *VANADATES, VANADIUM COMPOUNDS, SYNTHESIS, CHEMICAL ANALYSIS,)

*VAPOR PLATING

AD-271 436 62-2-2 DIV. 27
ROLLA METALLURGY RESEARCH CENTER, BUREAU OF MINES, MO.
DESCRIPTORS: (*ROCKET MOTOR NOZZLES, COATINGS, *VAPOR PLATING, *TUNGSTEN, TUNGSTEN COMPOUNDS, BERYLLIUM COMPOUNDS, OXIDES, CRYSTALLIZATION,)

*VEHICLES

AD-271 610 62-2-2 DIV. 11
CONTINENTAL ARMY COMMAND, FORT MONROE, VA.
DESCRIPTORS: (MOBILE, *RECOVERY VEHICLES, *CARGO VEHICLES, DESIGN, FEASIBILITY STUDIES FOR MILITARY OPERATIONS AND ARMY OPERATIONS,) (*VEHICLES, AIR TRANSPORTATION, RAILROADS, MAINTENANCE VEHICLES, MAINTENANCE TOOLS, MILITARY TRANSPORTATION, TRACKED VEHICLES, MAINTENANCE,)

*VELOCITY

AD-271 099 62-2-2 DIV. 12
DIAMOND ORDNANCE FUZE LABS., WASHINGTON, D. C.
DESCRIPTORS: (*GUIDED MISSILES, *VELOCITY, MEASUREMENT WITH RADAR EQUIPMENT AND ACCELEROMETERS, MATHEMATICAL ANALYSIS,) (GUIDED MISSILES, SURFACE TO SURFACE, CONTROL SYSTEMS, RANGE, VELOCITY, DETERMINATION,) (CONTROL OF COMBUSTION OF ROCKET MOTORS BY DETERMINATION OF SURFACE TO SURFACE, GUIDED MISSILES, VELOCITY,) GUIDED MISSILE TRAJECTORIES, ACCELERATION, DIGITAL SYSTEMS, ERRORS, VIBRATION,

*VERTICAL TAKE-OFF PLANES

AD-271 900 62-2-2 DIV. 1
AVRO AIRCRAFT, LTD. (CANADA).
DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, *FLYING PLATFORMS, AERODYNAMICS, PRESSURE, JETS, FLAPS, CONTROL SYSTEMS, FLIGHT TESTING,)

AD-271 902 62-2-2 DIV. 1
AVRO AIRCRAFT, LTD. (CANADA).
DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, *FLYING PLATFORMS, WIND TUNNEL MODELS, MODEL TESTS, DESIGN, AERODYNAMICS, AERODYNAMIC CONFIGURATIONS, AERODYNAMIC DATA, TABLES,)

*VETERINARY MEDICINE

AD-271 441 62-2-2 DIV. 16
HAZELTON LABS., INC., FALLS CHURCH, VA.
DESCRIPTORS: (*VETERINARY MEDICINE, *LABORATORY ANIMALS, PRIMATES, ANIMAL INDUSTRY,) (MEDICAL LABORATORIES, OPERATION, MAINTENANCE, HOUSING, ECOLOGY, SURVIVAL,)

*VIBRATION

AD-271 151 62-2-2 DIV. 25
MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
DESCRIPTORS: (*METALS, *CANTILEVER BEAMS, *FATIGUE (MECHANICS), *VIBRATION, *SHEAR STRESSES, LOADING, DEFORMATION, *LOAD DISTRIBUTION,) (TIME, MATERIALS, FREQUENCY, DAMPING, OSCILLATION,) (PROBABILITY, STATISTICAL DISTRIBUTIONS, STATISTICAL FUNCTIONS, HARMONIC ANALYSIS, STATISTICAL PROCESSES, GEOMETRY, INTEGRATION, DIFFERENTIAL EQUATIONS, INTEGRAL EQUATIONS, NUMERICAL ANALYSIS, SEQUENCES,)

AD-271 572 62-2-2 DIV. 25
MINNESOTA U., MINNEAPOLIS.
DESCRIPTORS: (STRUCTURES, MATERIALS, *VIBRATION, HYSTERESIS, *DAMPING, THEORY, STRESSES, MATHEMATICAL ANALYSIS,) (DISKS, BEAMS, CYLINDRICAL BODIES, SPHERES, TESTS, DATA,) (METL PLATES, STEEL, BRASS, COPPER, MAGNESIUM ALLYS, NICKEL ALLOYS, CHROMIUM ALLOYS,) (MACHINES TURBINE BLADES, BALL BEARINGS, AIRPLANE PANELS,) APPLIED MECHANICS, ALLOYS.

*VISCOSITY

AD-271 083 62-2-2 DIV. 9
RCA DEFENSE ELECTRONIC PRODUCTS, MOORESTOWN, N. J.
DESCRIPTORS: (*FLUID FLOW, BOUNDARY LAYER, ENERGY, *VISCOSITY, *WAKE, VELOCITY,) (TRASFORMATIONS (MATHEMATICS), MATHEMATICAL ANALYSIS,)

*VISIBILITY

AD-271 093 62-2-2 DIV. 31
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*NOMOGRAPHS, *VISIBILITY, *SWIMMING, MEASUREMENT,) (INSTRUMENTATION, *WATER, VISION, MATHEMATICAL ANALYSIS,) (*VISUAL PERCEPTION, SPACE PERCEPTION,)

AD-271 541 62-2-2 DIV. 2
AEROSPACE INFORMATION DIV., WASHINGTON, D. C.
DESCRIPTORS: (*CLOUDS, REDUCTION, USSR,) (SOLAR ECLIPSE, *VISIBILITY, CLIMATIC FACTORS, (AIRCRAFT, FLIGHT PATHS, CARBON DIOXIDE, TESTS,) ARTIFICIAL PRECIPITATION.

*VISION

AD-271 097 62-2-2 DIV. 28
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*VISION, *VISUAL PERCEPTION, *VISUAL THRESHOLDS, MEASUREMENT, DATA, VISIBILITY, COLLECTING METHODS, INSTRUMENTATION,)

*VISUAL PERCEPTION

AD-270 908 62-2-2 DIV. 28
SCHOOL OF AEROSPACE MEDICINE, BROOKS AIR FORCE BASE, TEX.
DESCRIPTORS: (*VISUAL PERCEPTION, STIMULATION, *PSYCHOMETRICS,) (*LANGUAGE, THEORY,) FACTOR ANALYSIS.

AD-270 938 62-2-2 DIV. 28
GEORGIA U., ATHENS.
DESCRIPTORS: (*PSYCHOLOGY, *VISUAL PERCEPTION, BEHAVIOR, THEORY, *PSYCHOMETRICS, CONDITIONED REFLEX, LEARNING,) (MATRIX ALGEBRA, MATHEMATICAL PREDICTION, PROBABILITY,) (*DISPLAY SYSTEMS, TARGET RECOGNITION, INTELLIGIBILITY,)

AD-271 093 62-2-2 DIV. 31
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*NOMOGRAPHS, *VISIBILITY, *SWIMMING, MEASUREMENT,) (INSTRUMENTATION, *WATER, VISION, MATHEMATICAL ANALYSIS,) (*VISUAL PERCEPTION, SPACE PERCEPTION,)

AD-271 096 62-2-2 DIV. 28
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*OPTICAL SYSTEMS, VISION, VISIBILITY, DETECTION, *VISUAL PERCEPTION, TARGET RECOGNITION,) (MATHEMATICAL ANALYSIS, EQUATIONS, MATHEMATICAL PREDICTION,)

AD-271 097 62-2-2 DIV. 28
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*VISION, *VISUAL PERCEPTION, *VISUAL THRESHOLDS, MEASUREMENT, DATA, VISIBILITY, COLLECTING METHODS, INSTRUMENTATION,)

*VISUAL THRESHOLDS

AD-271 097 62-2-2 DIV. 28
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*VISION, *VISUAL PERCEPTION, *VISUAL THRESHOLDS, MEASUREMENT, DATA, VISIBILITY, COLLECTING METHODS, INSTRUMENTATION,)

*VITAMIN B

AD-271 474 62-2-2 DIV. 16
WESTERN BIOLOGICAL LABS., CULVER CITY, CALIF.
DESCRIPTORS: (*RADIATION EFFECTS, *GAMMA RAYS, NUTRITION, *VITAMIN B12) (LABORATORY ANIMALS, GROWTH, LEARNING, SURVIVAL,)

*VOICE COMMUNICATION SYSTEMS

AD-270 971 62-2-2 DIV. 5
GENERAL DYNAMICS/ELECTRONICS, ROCHESTER, N. Y.
DESCRIPTORS: (*SPEECH, *SPEECH TRANSMISSION, *VOICE COMMUNICATION SYSTEMS, MULTIPLEX TRANSMISSION, CODING,) (DATA PROCESSING SYSTEMS, DIGITAL SYSTEMS, CIRCUITS,)

AD-271 198 62-2-2 DIV. 5
PHILCO CORP., PHILADELPHIA, PA.
DESCRIPTORS: (*SPEECH, *SPEECH TRANSMISSION, *SPEECH REPRESENTATION, *ELECTRONIC EQUIPMENT, SYNTHESIS, CODING, DESIGN,) (*VOICE COMMUNICATION SYSTEMS, DATA TRANSMISSION SYSTEMS, PRINTED CIRCUITS, ELECTRONIC CIRCUITS, TIMING CIRCUITS, BAND-PASS FILTERS, ANALOG SYSTEMS, DIGITAL SYSTEMS, DESIGN,)

*WAKE

AD-271 083 62-2-2 DIV. 9
RCA DEFENSE ELECTRONIC PRODUCTS, MOORESTOWN, N. J.
DESCRIPTORS: (*FLUID FLOW, BOUNDARY LAYER, ENERGY, *VISCOSITY, *WAKE, VELOCITY,) (TRASFORMATIONS (MATHEMATICS), MATHEMATICAL ANALYSIS,)

*WATER

AD-271 093 62-2-2 DIV. 31
DUNTLEY, S. Q., LA JOLLA, CALIF.
DESCRIPTORS: (*NOMOGRAPHS, *VISIBILITY, *SWIMMING, MEASUREMENT,) (INSTRUMENTATION, *WATER, VISION, MATHEMATICAL ANALYSIS,) (*VISUAL PERCEPTION, SPACE PERCEPTION,)

*WATER VAPOR

AD-271 636 62-2-2 DIV. 2
WOODS HOLE OCEANOGRAPHIC INSTITUTION, MASS.
DESCRIPTORS: (BAHAMA ISLANDS, *ATMOSPHERE, *WATER VAPOR, MEASUREMENT, STATISTICAL ANALYSIS, WIND,)

*WAVE CHARACTERISTICS

AD-271 376 62-2-2 DIV. 25
APPLIED PHYSICS LAB., JOHNS HOPKINS U., SILVER SPRING, MD.
DESCRIPTORS: (BOUNDARY LAYER, *FLUID FLOW, DRAG, SURFACE PROPERTIES,) (*WAVE CHARACTERISTICS, SUBSONIC FLOW, COMPRESSIBLE FLOW, *MACH NUMBER, SUPERSONIC FLOW,)

*WAVE TRANSMISSION

AD-271 157 62-2-2 DIV. 25
ANTENNA LAB., OHIO STATE U., RESEARCH FOUNDATION, COLUMBUS.
DESCRIPTORS: (*PLASMA PHYSICS, HYPERSONICS, HYPERSONIC FLOW, THEORY, ELECTROMAGNETIC WAVES, *WAVE TRANSMISSION, ANTENNAS, DIPOLE ANTENNAS, SLOT ANTENNAS, TEST FACILITIES, HYPERSONIC WIND TUNNELS, SHOCK TUBES,)

AD-271 411 62-2-2 DIV. 5
ELECTRICAL ENGINEERING RESEARCH LAB., U. OF TEXAS, AUSTIN.
DESCRIPTORS: (*RADIO WAVES, ATMOSPHERE, *WAVE TRANSMISSION, PROPAGATION, SCATTERING, REFRACTIVE INDEX, THEORY, MATHEMATICAL ANALYSIS.) (REFRACTOMETERS, ANALOG COMPUTERS, TELEMETERING DATA.)

*WAVEGUIDE SLOTS

AD-270 918 62-2-2 DIV. 8
WASHINGTON U., SEATTLE. COLL. OF ENGINEERING.
DESCRIPTORS: (*SLOT ANTENNAS, X BAND, ANTENNA RADIATION PATTERNS, ATTENUATION, MEASUREMENT, MATHEMATICAL ANALYSIS.) (ANTENNAS, *WAVEGUIDE SLOTS, MICROWAVE EQUIPMENT, MICROWAVES, PROPAGATION, ELECTROMAGNETIC PROPERTIES, ELECTROMAGNETIC FIELDS.)

*WAVEGUIDES

AD-271 010 62-2-2 DIV. 8
BROWN U., PROVIDENCE, R. I.
DESCRIPTORS: (*WAVEGUIDES, DIELECTRICS, ELECTROMAGNETIC PROPERTIES, *ELECTROMAGNETIC THEORY, WAVE TRANSMISSION, IMPEDANCE, HARMONIC ANALYSIS, OPERATORS (MATHEMATICS), TRANSFORMATIONS (MATHEMATICS), INTEGRAL TRANSFORMS.) (WAVEGUIDES, *ELECTROMAGNETIC WAVES, PROPAGATION, MATHEMATICAL ANALYSIS.)

*WELDING

AD-271 377 62-2-2 DIV. 26
AEROPROJECTS, INC., WEST CHESTER, PA.
DESCRIPTORS: (*REFRACTORY MATERIALS, *HEAT RESISTANT ALLOYS, *ULTRASONICS, *WELDING, SHEETS.) (MOLYBDENUM ALLOYS, TITANIUM ALLOYS, NIOBIUM, TUNGSTEN, ALUMINUM, STANDING WAVE RATIOS, FOILS, TITANIUM, TANTALUM.) (WELDS, MECHANICAL PROPERTIES, TENSILE PROPERTIES, SHEAR STRESSES, DEFORMATION, FRACTURE (MECHANICS).)

*WIDE FIELD CAMERAS

AD-271 301 62-2-2 DIV. 24
FAIRCHILD CAMERA AND INSTRUMENT CORP., SYOSSET, N. Y.
DESCRIPTORS: (**WIDE FIELD CAMERAS, *AERIAL CAMERAS, PRISMS (OPTICS), PANORAMIC SCANNERS FOR AERIAL RECONNAISSANCE, DESIGN, EFFECTIVENESS.)

*WIND

AD-271 082 62-2-2 DIV. 12
ARMY SIGNAL MISSILE SUPPORT AGENCY, WHITE SANDS MISSILE RANGE, N. MEX.
DESCRIPTORS: (*GUIDED MISSILES, SURFACE TO SURFACE, LAUNCHING, LAUNCHING SITES, METEOROLOGICAL DATA, **WIND, *TURBULENCE, *GUIDED MISSILE TRAJECTORIES, DRIFT, MATHEMATICAL PREDICTION, MEASUREMENT, TAYLOR'S SERIES, STATISTICAL FUNCTIONS.)

*WINGS

AD-270 986 62-2-2 DIV. 9
PRINCETON U., N. J.
DESCRIPTORS: (EXPERIMENTAL DATA, *WINGS, AERODYNAMIC CONFIGURATIONS, *AERODYNAMICS, *MOMENTS, WIND TUNNELS, SUBSONIC FLOW, VARIABLE PITCH PROPELLERS,) (*SHORT TAKE-OFF PLANES, AERODYNAMICS.) (LIFT, DRAG.)

*WIRE SCREENS

AD-270 949 62-2-2 DIV. 14
MATERIAL LAB., NEW YORK NAVAL SHIPYARD, BROOKLYN.
DESCRIPTORS: (*THERMAL RADIATION, RADIATION EFFECTS, ATOMIC BOMB EXPLOSIONS, NUCLEAR EXPLOSIONS, HEAT, TRANSMISSION, *GLASS, COATINGS, PROTECTIVE COVERINGS, *ALUMINUM, SHEETS, **WIRE SCREENS,) (TEST METHODS, TEST EQUIPMENT, SPECTROPHOTOMETERS, INDICATOR PAPERS.)

*WIRE STRAIGHTENERS

AD-271 165 62-2-2 DIV. 22
BALLISTIC RESEARCH LABS., ABERDEEN PROVING GROUND, MD.
DESCRIPTORS: (*BLAST, *SHOCK WAVES, COPPER, *WIRE, *EXPLOSIONS, ARGON, INTERFEROMETERS, PLASMA PHYSICS, ELECTRONS, DENSITY.)

*X-RAY PHOTOGRAPHY

AD-271 365 62-2-2 DIV. 30
OHIO STATE U. RESEARCH FOUNDATION, COLUMBUS.
DESCRIPTORS: (*NON-DESTRUCTIVE TESTING, *X-RAY PHOTOGRAPHY, RADIOGRAPHIC ANALYSIS, STEEL, GLASS TEXTILES, *WELDED JOINTS, METAL JOINTS, ROCKET CASES, RELIABILITY, SENSITIVITY,) (TELEVISION EQUIPMENT, CAMERA TUBES, IMAGE INTENSIFIERS (ELECTRONICS), PHOTOELECTRIC MATERIALS, SELENIUM, BERYLLIUM, GOLD.)

*X-RAY SPECTRUM

AD-270 919 62-2-2 DIV. 25
CORNELL U., ITHACA, N. Y.
DESCRIPTORS: (*ARGON, *X-RAY SPECTRUM, *FLUORESCENCE, MEASUREMENT, PULSE HEIGHT ANALYZERS, ATOMIC STRUCTURE,) (RADIOACTIVE ISOTOPES, IRON.)

*X RAYS

AD-271 589 62-2-2 DIV. 14
NATIONAL CARBON CO., INC., CLEVELAND, OHIO.
DESCRIPTORS: (*GRAPHITE, *X RAYS, *RADIOGRAPHY, SENSITIVITY, CHEMICAL IMPURITIES, DISTRIBUTION,) (X RAYS, DETECTORS, FLUORESCENT SCREENS, PHOTOGRAPHIC FILM, IONIZATION CHAMBERS, SHEETS, ALUMINUM, SELENIUM, COATINGS.)

*YTTRIUM

AD-271 582 62-2-2 DIV. 17
RESEARCH CHEMICALS, INC., BURBANK, CALIF.
DESCRIPTORS: (PHASE STUDIES, *YTTRIUM, *RARE EARTHS, *OXYGEN, SOLUBILITY, ERBIUM, NEODYMIUM, SAMARIUM, EUTECTICS, INTERMETALLIC COMPOUNDS, PHASE TRANSITIONS, METALLURGICAL ANALYSIS, GRAINS (METALLURGY), MECHANICAL PROPERTIES, TENSILE PROPERTIES, MICROSTRUCTURE,) (ALLOYS, METALS, PREPARATION, PURIFICATION, CORROSION RESEARCH,) (COBALT ALLOYS, NICKEL ALLOYS, TANTALUM ALLOYS, NIOBIUM ALLOYS, ZIRCONIUM ALLOYS, BERYLLIUM ALLOYS,) *RARE EARTH COMPOUNDS, *RARE EARTH ELEMENTS.

*ZINC

AD-271 586 62-2-2 DIV. 17
KECK, B. M., LAB. OF ENGINEERING MATERIALS, CALIF. INST. OF TECH., PASADENA.
DESCRIPTORS: (*SINGLE CRYSTALS, *ZINC, CRYSTAL STRUCTURE, MICROSTRUCTURE, LATTICES, DEFORMATION,) (PREPARATION, PURIFICATION, ZONE MELTING, METALLIC CRYSTALS, GROWTH, ELECTROLYTIC POLISHING, SOLUTIONS.)

TECHNICAL ABSTRACT BULLETIN

1. AIRCRAFT AND FLIGHT EQUIPMENT

AD-271 119 Div. 1, 22
(TISTA/LSK) OTS price $1.60

Naval Weapons Lab., Dahlgren, Va.
FEASIBILITY STUDY OF SHAPED CHARGE SEPARATION OF THE AIRCRAFT FLIGHT CAPSULE II.
Status summary,
by R. I. Rossbacher and G. W. Baker. 23 Jan 62, 8p. illus. (NWL rept. no. 1790)
Unclassified report

DESCRIPTORS: (*Jettisonable cockpits, Separation by Explosive actuators, Release mechanisms, *Shaped charges, Installation, Maintenance, Reliability, Design, Tests, Feasibility studies.) (Naval aircraft, *Jet fighters, Aviation safety.)

Developments since the aircraft feasibility experiments of 1959-60 are summarized. Materials and assembly techniques were developed which have been functionally tested and are considered likely to prove serviceable. Light weight laminated plastic structures have been developed which will contain the back blast. Additional safety tests are reported. It is concluded that materials and techniques are available in experimental quantities for aircraft capsule Linear Shaped Charge (LSC) separation systems which, subject to MIL-D-21625 qualification, are of a serviceable type. Blast effects and fragment damage, considered acceptable in the frame of reference of the F8U-1 feasibility tests, have been further reduced through the development of a laminar backup structure. (Author)

AD-271 166 Div. 1, 14, 17
(TISTM/EJH) OTS price $10.50

Boeing Co., Wichita, Kansas.
BOEING-WICHITA MATERIALS AND RESEARCH DEVELOPMENT PROGRAMS 1957-1961.
Summary rept. no. 1, 1 Apr-30 June 61,
by A. H. Poe and H. E. Shigley. 30 June 61, 136p. incl. illus. tables.
(Contract AF 33(616)8141, Proj. 1(8-7381))
Unclassified report

DESCRIPTORS: (*Airframes, *Materials, *Metals, *Alloys, Titanium alloys, Extrusion, *Ceramic coatings, *Refractory coatings, Flame spraying, Sealing compounds, Elastomers, *Plastics, Expanded plastics, *Adhesives, Resin adhesives, Sandwich construction, Honeycomb cores, Laminates, Hoses.) (Mechanical properties, Tensile properties, Climatic factors, Failure (Mechanics), High temperature research.) (Polymers, Fluorides, Fluorocarbons, Silicones, Silanes, Urethanes, Pyrimidines.)

Contents: Light metals and alloys: Titanium L-section extrusion (6Al-4V); Inorganic nonmetallic solids: High temperature ceramic coatings; Elastomers: Q-2-0046 RTV fluorosilicone sealant; One part RTV silicone rubber; Plastics: Telfon hose; Effect of moisture and weather on foam; Polyurethane foam for fuel cell float valves; Liquid and semi-solid high polymers: Adhesive, Epoxy, Epon 901; Adhesive, Eastman 910; Adhesive, structural, Metalbond 406; Triallyloxy pyrimidine; Composite materials: Honeycomb core, 5052 Al alloy, Al alloy; A-172 silane fabric impregnated with polyester resin; Diluents for Epon 828 resin; Fluorocarbon elastomer coated fabric.

AD-271 167 Div. 1, 14, 17
(TISTM/EJH) OTS price $19.75

Boeing Co., Wichita, Kans.
BOEING-WICHITA MATERIALS AND RESEARCH DEVELOPMENT PROGRAMS, 1957-1961.
Summary rept. no. 2, 1 July-30 Sep 61,
by A. H. Poe and H. E. Shigley. 30 Sep 61, 347p. incl. illus. tables.
(Contract AF 33(616)8141, Proj. 1(8-7381))
Unclassified report

DESCRIPTORS: (*Airframes, *Radomes, *Materials, Metals, Alloys, Stainless steel, Chemical milling, Plating, Aluminum, Manganese, Cadmium plating, Polymers, Heat resistant polymers, Plastics, Adhesives, Resin adhesives, Enamel coatings, Varnishes, Organic coatings, Laminates, Textiles, Lubricants.) (Metal joints, Titanium.) (Bonding, Brazing, Ceramic materials.) (Jet fuels, Ignition.) (High temperature research, Machining.)

Contents: Iron and steel: AM 350 Stainless steel, chemical etching; Light metals and alloys: Ti fasteners (6Al-4V); vacuum plated Al, corrosion resistance of various aluminums; Heavy non-ferrous metals and alloys: Vacuum plated Cd, electroplated Mn; Plastics: Metal bonding materials, adhesives, Paraplast #33, epoxy tubing, 3M-471 plastic tape, epoxy mat mold die; Liquid and semi-solid high polymers: Adhesives, high temperature lubricants, enamels and lacquers, epoxy organic coatings, neoprene organic coating; Fibrous and filamentary materials: Investigation of fabrics for lint free condition; Composite materials: Ceramic braze, Epon 828 and 143 glass fabric laminates, 181 Volan and 181-A-1100 silane finish fabric, reinforced plastics for radomes, decals.

AD-271 418 Div. 1, 19, 12
(TISTW/JRG) OTS price $1.60

General Electric Co., Burlington, Vt.
STUDY OF PARAMETERS WHICH AFFECT PELLET FLOW

TYPE ACCELEROMETERS.
Monthly progress rept. no. 16, 1-30 Sep 61. 15 Oct 61, 11p. incl. illus. tables (Rept. no. 61 APB 778-16)
(Contract DA 36-034-ORD-3230)
Unclassified report

DESCRIPTORS: (Fluid flow, *Accelerometers, Glass, Spheres, Pellets, Surface properties, Mathematical analysis, Loading, Configuration Theory.)

Research on pellet-flow accelerometers is continuing. A theoretical evaluation was made of the packing arrangements in both annular and circular orifices, and a theoretical explanation was advanced concerning why the circular orifice gives test results which can be correlated by a single mathematical equation while the annular orifice does not. (Author)

AD-271 419 Div. 1, 19, 12
(TISTW/JRG) OTS price $1.60

General Electric Co., Burlington, Vt.
STUDY OF PARAMETERS WHICH AFFECT PELLET FLOW TYPE ACCELEROMETERS.
Monthly progress rept. no. 14, 1-31 July 61. 15 Aug 61. 11p. incl. tables (Rept. no. 61 APB 778-14)
(Contract DA 36-034-ORD-3230)
Unclassified report

DESCRIPTORS: (Fluid flow, Pellets, Glass, Spheres, *Accelerometers, Tests, Test methods, Scheduling.)

Research is continuing on pellet-flow accelerometers. An experiment to determine the efflux rate of glass beads through an annular orifice is considered. It provides for conducting 104 efflux tests to correlate all dominant efflux parameters. If interactions different from those determined for conical orifices exist, then statistical correlation may not be achieved. All efflux meter parts needed for efflux testing with annular orifices were fabricated and gaged. A few trial efflux tests were performed, but the preliminary data obtained are inconclusive. (Author)

AD-271 420 Div. 1, 19, 12
(TISTW/JRG) OTS price $4.60

General Electric Co., Burlington, Vt.
STUDY OF PARAMETERS WHICH AFFECT PELLET FLOW TYPE ACCELEROMETERS.
Monthly progress rept. no. 15, 1-31 Aug 61. 15 Sep 61, 44p. incl. illus. tables (Rept. no. 61 APB 778-15)
(Contract DA 36-034-ORD-3230)
Unclassified report

DESCRIPTORS: (Fluid flow, *Accelerometers, Glass, Spheres, Pellets, Surface properties, Mathematical analysis, Loading, Configuration, Tests, Test methods, Theory.)

The investigation concerning pellet-flow accelerometers is continuing. Bead efflux data have been collected for the annular orifice. The original experimental plan was modified many times to obtain a correlation of data. Unfortunately, however, correlation was not obtained. Hypothesized reasons for the seeming lack of correlation are given. A statistical analysis of repeatability and equation predictability for the conical orifice test data is included. (Author)

AD-271 432 Div. 1
(TISTA/SEB) OTS price $3.60

Lightning and Transients Research Inst., Minneapolis, Minn.
EQUIVALENT FIELD METHOD FOR TESTING AIRCRAFT STATIC DISCHARGERS,
by M. M. Newman, J. D. Robb and others. Jan 62, 26p. incl. illus. 4 refs. (L and T rept. no. 396)
(Contract AF 33(616)7828, Proj. 4357)
(ASD TN 61-163) Unclassified report

DESCRIPTORS: (Aircraft, Airplanes, Wings, Electrical corona, Electric fields, Static electricity, *Static dischargers, Test methods, Test equipment.) Design.

A new test system for aircraft static discharges was devised to permit comparison of standard type dischargers with new dischargers which require specific orientation with RF fields about aircraft. The system consists of a simulated aircraft section, surrounded by an octagonal screen chamber shaped to reproduce approximately an equipotential, as measured about a model aircraft in an electrolytic tank. The new system preserves the electric field relationships which would be found at a discharger extremity in flight and permits correlation of the field magnitudes by use of electrolytic tank plots. A theoretical study of radio interference fields produced by corona discharges on metal and resistive needles was carried out. Studies indicate that for the assumed geometry, an orientation parallel to the supporting aircraft surface reduces the interference field magnitudes by approximately a factor of 200 over an orientation perpendicular to the aircraft mounting surface. Also corona discharges from resistive points show an additional reduction in interference magnitudes of about 200 over the corresponding metal point discharges in either orientation. (Author)

AD-271 500 Div. 1
(TISTA/LSK) OTS price $18.00

Avro Aircraft, Ltd. (Canada).
ANALYSIS OF TESTS OF THE AVROCAR IN THE N.A.S.A. 40 x 80 FT. WIND TUNNEL, AMES RESEARCH CENTER,
by D. C. Whittley and D. B. Garland. Feb 61, 286p. incl. illus. tables (Rept. no. 500/AERO Test/407)
(Contract AF 33(600)42163)
Unclassified report

DESCRIPTORS: (*Vertical take-off planes, *Flying platforms, Aerodynamics, Pressure, Jets, Flaps, Control systems, Flight testing.)

An analysis is presented of some aspects of the full scale wind tunnel tests of the Avrocar

vehicle. Methods used to analyze force and pressure data are formulated and results are compared with theory and small scale model tests. Aerodynamically, the performance demonstrated by the first Avrocar vehicle in its initial configuration was disappointing in that a low lift curve slop, a large nose-up pitching moment and insufficient jet vectoring capability precluded flight in free air and in the ground cushion above about 35 mph. Modifications to the aircraft based on these and other test results have been made, the major change being in the redesign of the trailing edge region where a rearward-facing nozzle, containing a pitch control vane to provide adequate jet vectoring control, has been incorporated. The jet flap effect thus obtained is expected to allow flight in free-air as well as at higher speeds in the ground cushion. (Author)

AD-271 502 Div. 1, 9
(TISTA/VGW) OTS price $23.50

Avro Aircraft, Ltd. (Canada).
AVROCAR CONTINUATION PROGRAM. DATA REPORT FOR 1/20 SCALE AVROCAR MODEL.
comp. by P. J. McGee. Jan 61, 452p. incl. illus. tables, 4 refs. (Rept. no. 500/AERO Test/410)
(Contract AF 33(600)42163)
Unclassified report

DESCRIPTORS: (*Vertical take-off planes, *Flying platforms, Wind tunnel models, Model tests, Design, Aerodynamics, Aerodynamic configurations, Aerodynamic data, Tables.)

AD-271 539 Div. 1, 26
(TISTA/VGW) OTS price $2.25

Boeing Co., Seattle, Wash.
ANTIFRICTION AIRFRAME BEARING MOUNTING STUDY -90 DEGREES TO 2000 DEGREES F.
Rept. for 15 June 60-15 Apr 61 on Bearing and Mountings for Advanced Systems,
by R. H. Bradley and J. W. Van Wyk. July 61, 75p. incl. illus. tables, 23 refs.
(Contract AF 33(616)6949, Proj. 1315)
(ASD TR 61-153) Unclassified report

DESCRIPTORS: (*Airframe bearings, Ball bearings, Seats, Attachment to Airframes, Adhesives, Epoxy resins, Phenolic resins, Shear stresses, High temperature research, Refractory materials, Heat resistant alloys, Design, Tests.)

This program consisted of a comprehensive industry and literature survey followed by a detail design study of airframe bearing retention methods. The design study aided by heat transfer theory and tests, resulted in evaluation of the advantages and disadvantages of many retention designs. A tapered mount or dished face retention design appears most feasible for -90 to 2000 F airframe bearings. This design is proposed for all temperature ranges due to its ability to compensate for differential thermal expansion. It is recommended that future effort be expanded to establish firm design data for this system. (Author)

AD-271 547 Div. 1
(TISTA/SEB) OTS price $9.60

Federal Aviation Agency, Washington, D. C.
NEW YORK ARTCC IFR AIR TRAFFIC ACTIVITY, BUSY TWO-HOUR PERIOD, 1961-1970.
Final rept.,
by Harry L. Lamb and Philip J. Steece. Dec 61, 115p. incl. illus. tables.
Unclassified report

DESCRIPTORS: (*Air traffic, *Instrument landings, New York, *Air traffic control systems, Data processing systems, Display systems, Analysis.)

Air traffic samples are provided of the IFR activity in the airspace of the New York ARTCC area (domestic and oceanic) during a busy two hour period of a busy IFR day for the years 1961, 1965 and 1970. These traffic samples were prepared by the Traffic Analysis Branch in compliance with a request from the Air Traffic Control Systems Branch, Test and Experiment Division, in preparation for the operational evaluation of the data processing and display portion of the air traffic control system. (Author)

AD-271 570 Div. 1, 13
(TISTA/LSK) OTS price $6.60

Minneapolis-Honeywell Regulator Co., Minn.
ADVANCED FLIGHT VEHICLE SELF-ADAPTIVE FLIGHT CONTROL SYSTEM. PART III. SUPPORT EQUIPMENT STUDY,
by C. B. Exby, J. R. Gray, and J. W. Harrison.
24 Feb 61, 64p. incl. illus. tables.
(Contract AF 33(616)6610, Proj. 8226)
(WADD TR 60-651, pt. 3)
Unclassified report

DESCRIPTORS: (Hypervelocity vehicles, *Rocket planes, *Automatic pilots, Control simulators, Control systems, Design.) (*Ground support equipment, Control panels, Instrumentation, Test sets, Test equipment, Analog computers, Maintenance, Maintenance equipment, Design.) (Flight testing, Simulation, Test methods.)

Results are presented of the design study to develop the ground support equipment for the MH-96 Adaptive Flight Control System to be tested in the X-15 aircraft. Design solutions are presented which reflect the problem areas that became apparent as the designs of the ground support equipment progressed. Since the final flight control system design changes have not yet been made, the GSE solutions have also not been finalized. However, this report presents a summary of the design practices being followed in the development of the ground support equipment for the MH-96 Adaptive Flight Control System. (Author)

AD-271 613 Div. 1
(TISTB/AW) OTS price $8.60

General Dynamics/Fort Worth, Tex.
THE EFFECT OF ACCELERATION ON HUMAN CENTERS OF GRAVITY,
by J. W. Chaffee. 26 Dec 61, 96p. incl. illus. table, 9 refs. (Rept. no. FZY-013)
Unclassified report

DESCRIPTORS: (*Acceleration, Gravity, Thrust, Body, Anthropometry, Aviation personnel.) (*Aviation safety, *Bailout, *Ejection seats, Design, Test methods, Safety harness, Cockpits, Catapults.)

The location in two-dimensional (x-z) space of the center of gravity of the seated human body was studied on 25 living male subjects under conditions of experimentally controlled changes in the angle at which a 1g acceleration acted upon the completely restrained body. Varying the direction of acceleration from 15 degrees through 80 degrees, measured from the torso axis forward, produced a migration of the group average center of gravity along a curved path of 2.15 seconds arc length, a consistent rotation of the axis of maximum individual variability from 10 degrees 53 minutes aft of the torso axis to a maximum forward angle of 90 degrees 16 minutes, and a characteristic fluctuation in absolute size of the individual variation about the group average. The practical applications of these findings to the design of rocket-powered systems (e.g., escape capsules) is discussed. (Author)

2. ASTRONOMY, GEOPHYSICS AND GEOGRAPHY

AD-270 931 Div. 2
(TISTP/FR) OTS price $1.60

Radio Observatory, Calif. Inst. of Tech., Owens Valley, Calif.
MEASUREMENTS OF THE POLARIZATION AND EXTENT OF THE DECIMETER RADIATION FROM JUPITER,
by D. Morris and G. L. Berge. 1961, 8p. illus., 15 refs.
Unclassified report

DESCRIPTORS: (*Jupiter, *Extraterrestrial radio waves, Intensity, Polarization, Measurement.)

Measurements of the non-thermal radiation from Jupiter at 960 and 1390 Mc yield figures for Jupiter as a radio source. The values can be accounted for by synchrotron radiation from relativistic electrons trapped in a Jovian Van Allen Belt. Variations in the intensity and plane of polarization of the 1390 Mc/s radiation suggest that Jupiter's magnetic axis is inclined at 9 degrees to its rotational axis. The magnetic poles are at System III longitudes of 200 degrees and 20 degrees. (Author)

AD-270 932 Div. 2
(TISTE/CRJ) OTS price $3.60

Radio Observatory, Calif. Inst. of Tech., Owens Valley, Calif.
BRIGHTNESS DISTRIBUTION IN DISCRETE RADIO SOURCES. III. THE STRUCTURE OF THE SOURCES,
by P. Maltby and A. T. Moffet. 1962, 14p. illus. tables, 24 refs.
Unclassified report

DESCRIPTORS: (*Radio waves, *Extraterrestrial radio waves, Radio signals, Sources.) (*Stars, *Galaxies, Brightness, Visibility, Fourier analysis, Series.) *Radio astronomy.

The visibility functions of 195 radio sources are interpreted in terms of the structure of these sources. Of the sources, 174 are known or presumed to be extragalactic. Seventy-five of these extragalactic sources are resolved with the interferometer spacings used, and complex structure is found in all but 13. In the sources showing complex structure, two similar components with nearly equal intensities are found in 15, 40 show two or more components of unequal intensities, while 7 appear to be a bright core surrounded by a halo. It is suggested that the majority of all extragalactic sources have complex structure. Data are also given on the brightness distributions in the 21 galactic sources observed. In contrast to the extragalactic sources, emission from the galactic sources is typically confined to a single region. (Author)

AD-271 004 Div. 2, 25
(TISTP/MFA) OTS price $1.10

Microwave Lab., Stanford U., Calif.
ELECTRODYNAMIC PROBLEMS OF ASTROPHYSICS.
Technical status rept. no. 5, 1 Oct-31 Dec 61,
by P. A. Sturrock. Jan 62, 5p. incl. illus.
(ML rept. no. 879)
(Contract AF 49(638)342, Proj. 9768)
Unclassified report

DESCRIPTORS: (*Astrophysics, Electromagnetic waves, *Plasma oscillations, Thermal radiation, Plasma physics.) (Shock waves, Magnetohydrodynamics.) (Extraterrestrial radio waves, Magnetic storms, *Solar flares, Solar corona, Terrestrial magnetism, Gas ionization.) (Harmonic analysis, Nonlinear systems.)

The origin of radiation at the second harmonic of the plasma frequency is set forth as the nonlinear mechanism which couples two plasma oscillations to one electromagnetic wave. This is at variance with the suggestion that radiation at the second harmonic is to be attributed to scattering of the excited plasma oscillations from thermal fluctuations of the plasma at the plasma frequency. The difficulty in comparing radiation by the two mechanisms is that one would expect the wave-number spectra of the two types of excitation of the plasma to be quite different. In the case that the spectra are similar, it can easily be demonstrated that radiation by the nonlinear mechanism is more important than that due to the Ginzburg-Zheleznyakov mechanism. (Author)

AD-271 006 Div. 2
(TISTP/GRW) OTS price $2.60

Indiana U., Bloomington.
COMMERCIAL GEOGRAPHY OF ANTIGUA,
by Arlin D. Fentem. May 61, 24p. incl. illus. tables (Technical rept. no. 11)
(Contract Nonr-90813, Proj. NR 388-051)
Unclassified report

DESCRIPTORS: (Agriculture, *Geography, Leeward Islands, Economics.)

AD-271 014 Div. 2
(TISTP/FR) OTS price $8.60

Air Weather Service, Scott Air Force Base, Ill.
TERMINAL FORECAST REFERENCE FILE, HUNTER AIR FORCE BASE.
1962, 1v. incl. illus. tables.
Unclassified report

DESCRIPTORS: (*Georgia, Airports, Air Force operations, *Climate, Weather forcasting, Handbooks.)

AD-271 058 Div. 2
(TISTP/FR) OTS price $4.60

Illinois State Water Survey, Urbana.
STUDY OF INTENSITY OF SURFACE PRECIPITATION USING RADAR INSTRUMENTATION.
Final rept., 1 Apr 58-30 Sep 61,
by R. M. Johnson, E. A. Mueller, and G. E. Stout.
30 Sep 61. 41p. incl. illus. tables, refs.
(Contract DA 36-039-sc-75055)
Unclassified report

DESCRIPTORS: (*Raindrops, Measurement, Photographic analysis, Instrumentation.) (Raindrops, *Electrostatic fields.) (Raindrops, Stability.) (Precipitation, Meteorological radar.)

The progress and results of the research accomplished during the year ending September 30, 1961, is presented. An evaluation of the streak camera as a raindrop sizing device is presented. Results of separating the raindrop data according to upper air stability are reviewed. The operations of the cameras at Island Beach, New Jersey; Franklin, North Carolina; and Mt. Withington, New Mexico, are summarized. One of the New Mexico storms which produced hail is examined in detail. (Author)

AD-271 061 Div. 2
(TISTP/FR) OTS price $2.60

Marine Lab., U. of Miami, Coral Gables, Fla.
STUDIES OF HURRICANE SPIRAL BANDS AS OBSERVED ON RADAR.
Final rept. 1 Oct-31 Dec 56,
by H. V. Senn, H. W. Hiser, and R. C. Bourret.
Jan 57, 22p. incl. illus. (Rept. no. ML 14971)
(Contract Cwb-9066)
Unclassified report

DESCRIPTORS: (*Hurricanes, Precipitation, *Helixes, Meteorological radar.)

AD-271 147 Div. 2
(TISTP/FR) OTS price $5.60

Saskatchewan U. (Canada).
A STUDY OF THE MOHOROVICIC DISCONTINUITY NEAR FLIN FLON, MANITOBA.
Final rept.,
by D. H. Hall and W. C. Brisbin. 29 Dec 61, 46p. illus. 22 refs.
(Contract AF 19(604)8482, Proj. 8652)
(AFCRL 62-205) Unclassified report

DESCRIPTORS: (Manitoba, Geophysical prospecting, *Seismic waves, Measurement, Seismological stations.)

The results are presented of a deep crustal seismic survey executed during the summer of 1961 in an area in central western Manitoba. It consisted of a seismic profile along Manitoba provincial highway No. 10 from the North Star Mine in the northern portion of the area to Mafeking in the south. The purpose of the study was to test the feasibility of explosion seismology studies in this portion of the Precambrian shield and, if warranted, to interpret the crustal structure in this area where pronounced gravity anomalies suggest a major warping of the earth's crust. Eight shots were detonated within the abandoned water-filled workings at the North Star Mine and seismic signals were received at distances up to 135 miles to the south. (Author)

AD-271 159 Div. 2, 32
(TISTP/FR) OTS price $5.60

Agricultural Research Service, Riverside, Calif.
WATER TRANSFER FROM SOIL TO THE ATMOSPHERE AS RELATED TO SOIL PROPERTIES, PLANT CHARACTERISTICS AND WEATHER.
Annual rept.,
by L. A. Richards, W. R. Gardner and others.
July 61, 48p. incl. illus. tables.
Unclassified report

DESCRIPTORS: (Water, Evaporation, *Evapotranspiration, *Soils, Montmorillonite, Atmosphere, *Micrometeorology.) (Vapor pressure, Hygrometers, Temperature, Resistance thermometers.)

An investigation was made of major interrelated factors which influence the transfer of water from soil through plants to the atmosphere. Results are reported from three studies: (1) effect of temperature on relative vapor pressure of water in soil; (2) relation of psychrometric to membranous measurements of water in soil; and (3) evaporation from soil. (Author)

AD-271 192 Div. 2, 8
(TISTP/FR) OTS price $1.60

Ionosphere Research Lab., Pennsylvania State U., University Park.
INVESTIGATION OF HIGH FREQUENCY PROPAGATION IN THE IONOSPHERE USING SATELLITE TRANSMISSIONS.
Quarterly status rept. no. 10, 15 Oct 61-15 Jan 62,
by W. J. Ross. 15 Jan 62, 14p.
(Contract AF 33(616)6157)
Unclassified report

DESCRIPTORS: (Measurement of *Ionosphere by Radio reception of *High frequency, Radio waves from Satellite vehicles.)

The use of satellite radio transmissions to study the regular and irregular properties of the ionosphere is discussed. Preliminary data are given on the presence of elongated inhomogeneities at about 500 kilometers height. The evaluation of electron content at midlatitude, and near the magnetic equator is described. (Author)

AD-271 438 Div. 2, 24
(TISTP/MH) OTS price $1.60

Geonautics, Inc., Washington, D. C.
PHOTOGRAMMETRIC FLASH TRIANGULATION FOR CORPS OF ENGINEERS FIELD USE.
Interim technical rept. no. 3, 1 Feb-30 June 61,
by Heinrich K. Eichhorn. 15 July 61, 15p. incl. illus. tables.
(Contract DA 44-009-eng-4646, Proj. 8T35-12-001-01)
Unclassified report

DESCRIPTORS: (*Geodesics, *Aerial photography, *Mapping, Rockets, Photoflash projectiles.) (Photographic equipment, Geodesics, Photoflash bulbs.) (Trigonometry, Geodesics.)

An error analysis of the proposed photogrammetric flash triangulation system for Army use in extending geodetic control over short and medium ranges is presented. The proposed field instrumentation system is based on the use of portable cameras and adjustable equatorial mounts for guiding on the star background during the observations. The main advantage is that the field operations do not require the times of the occurrence of the flashes or the photographic exposures. The expected errors of the system were computed from an analysis of the covariance matrix of the 11 unknown parameters which occur in the case of minimum redundancy. Various triangulations which involve distances of less than 100 miles to 1000 miles with well-and poorly-defined geometry were studied. Under conditions of minimum redundancy results indicated that the proposed observation techniques are capable of achieving accuracies which approach that of first order triangulation. (Author)

AD-271 439 Div. 2, 24
(TISTA/VGW) OTS price $5.60

Geonautics, Inc., Washington, D. C.
PHOTOGRAMMETRIC FLASH TRIANGULATION FOR CORPS OF ENGINEERS FIELD USE.
Final technical rept.,
by Heinrich K. Eichhorn. 15 Aug 61, 46p. incl. illus. tables, 19 refs.
(Contract DA 44-009-eng-4646, Proj. 8T35-12-001-01)
Unclassified report

Original contains color plates; all ASTIA reproductions will be in black and white. Original may be seen in ASTIA Hq.

DESCRIPTORS: (Geodesics, *Geodetic astronomy, High altitude, *Photoflash bombs in Sounding rockets for Position finding, *Bridges, Range, Control systems for *Mapping.) (Trigonometry, *Matrix algebra, Errors, Mathematical analysis.) (Geodetic data, Data processing systems.)

Error analysis was continued of the proposed photogrammetric flash triangulation for Army use in extending geodetic control over short and medium ranges. The proposed field instrumentation system under consideration is based on the use of portable cameras and adjustable equatorial mounts for guiding on the star background during the observations. The main advantage is that the field operations do not require the times of the occurrence of the flashes or the photographic exposures. Analytical methods are developed for a rigorous least squares adjustment of redundant observational data. The results of an error analysis of a redundant hypothetical configuration using two known stations, five unknowns and two flash points are then presented to provide an indication of the expected accuracy of the observation techniques. Conclusions and recommendations are presented for future evaluation of the proposed flash triangulation system. (Author)

AD-271 442 Div. 2
(TISTP/JW) OTS price $12.00

Photogrammetry Lab., Mass. Inst. of Tech., Cambridge.
ANALYTICAL AERIAL TRIANGULATION ERROR ANALYSIS AND APPLICATION OF COMPENSATING EQUATIONS TO THE GENERAL BLOCK TRIANGULATION AND ADJUSTMENT PROGRAM.
Interim technical rept. on Phase 2, 15 June 60-30 June 61,
by L. Andreu R., Z. M. Elias and others.
30 June 61, 157p. incl. illus.
(Contract DA 44-009-eng-4420, Proj. 8-35-11-520)
Unclassified report

DESCRIPTORS: (*Atmospheric refraction, Lenses, Distortion, Errors, *Analysis of variance, Geodesics, *Mapping.)

The results are presented of a study directed towards the determination of analytic means of compensating for random and systematic errors associated with aerial triangulation. Analytic routines are presented for the compensation of systematic errors resulting from Atmospheric Refraction and Lens Distortion. The conditional equations as found in the General Block Triangulation and Adjustment Program were modified in such manner that they would become a part of the random error compensation system. The derivations and finalized forms of the modifications are treated. (Author)

AD-271 452 Div. 2, 1
(TISTP/WH) OTS price $8.10

Borg-Warner Controls Div., Borg-Warner Corp., Santa Ana, Calif.
ANALYSIS OF NATIONAL AVIATION METEOROLOGICAL REQUIREMENTS THROUGH 1975, VOLUME I.
Final rept.,
1 Aug 61, 61p. incl. illus. tables.
(Contract FAA/BRD-139)
Unclassified report

DESCRIPTORS: (*Civil aviation, All weather aviation, *Climatic factors, Meteorology, Meteorological data, *Air traffic control systems.)

A study was undertaken to determine the weather information required in our national aviation operations through 1975 and to outline methods of supplying it. To satisfy the requirements that emerged from this study, an aviation weather system must solve a great many problems. This study identifies those problems and proposes solutions for them. (Author)

AD-271 453 Div. 2, 1
(TISTP/WH) OTS price $19.75

Borg-Warner Controls Div., Borg-Warner Corp., Santa Ana, Calif.
ANALYSIS OF NATIONAL AVIATION METEOROLOGICAL REQUIREMENTS THROUGH 1975. VOLUME III.
Final rept., 1 Aug 61.
1 Aug 61, 1v. incl. illus. tables.
(Contract FAA/BRD-139)
Unclassified report

DESCRIPTORS: *Civil aviation, All weather aviation, *Climatic factors, Meteorology, Meteorological data, Air traffic control systems.

Civil and military aviation weather services are described as they exist today. The description includes those military installations and associated military communication links which contribute weather observations to the civil system. The products and facilities of the civil system

are widely used by the military services in the continental United States. In addition, the military weather services operate facilities and produce many products similar to those of the civil weather service but intended for their own purposes. (Author)

AD-271 505 Div. 2
(TISTP/FR) OTS price $9.10

New York U. Coll. of Engineering, N. Y.
CONTRIBUTION TO THE PROBLEM OF OCEANIC CIRCULATION.
by El Sayed Mohamed Hassan and David M. Garner.
Oct 61, 91p. incl. illus. table, refs.
(Contract N-62306-794)
Unclassified report

DESCRIPTORS: (*Ocean models, *Ocean currents, Temperature, Wind.) (Atlantic Ocean, Oceanographic data, Oceanographic charts.)

Contents:
Models for the numerical computations of the oceanic circulation
The wind driven steady state ocean circulation - An hypothesis
Notes on the structure of the oceanic upper mixed layer

AD-271 512 Div. 2, 25
(TISTP/FR) OTS price $1.60

Aerospace Information Div., Washington, D. C.
PHENOMENA IN THE UPPER ATMOSPHERE. REVIEW OF SOVIET LITERATURE.
Monthly rept. no. 21 for Jan 62.
31 Jan 62, 18p. 14 refs. (AID rept. no. 62-6)
Unclassified report

DESCRIPTORS: (*Ionosphere, Ionization.) (*Aurorae, Night sky, Luminescence.) (*Solar corona, Solar flares, Polarization.) Van Allen radiation belt, *Cosmic rays, *Atmospheric electricity, *Plasma physics.

The following topics are discussed: Solar phenomena and the ionosphere, Van Allen belts and cosmic rays, Atmospheric electricity, The tropopause, aurorae and night glow. (Author)

AD-271 513 Div. 2
(TISTP/FR) OTS price $1.60

Aerospace Information Div., Washington, D. C.
THE ENERGY OF EARTHQUAKES. SUMMARY TRANSLATION.
24 Jan 62, 12p. incl. illus. (AID rept. 62-12)
Unclassified report

DESCRIPTORS: (*Earthquakes, Classification, *Seismic waves, Attenuation, Nomographs.)

An attempt is made to classify earthquakes according to the amount of energy flowing through a sphere of a given radius-- the reference sphere --and to establish a relationship between the total seismic energy released by an earthquake and the flow of energy through the reference sphere. Determination of the energy density at the observation points, attenuation of the density of energy with distance, design of rated nomographic charts, and accuracy of the energy determination are discussed. Energy values obtained by the new method are compared with those derived by Golitsyn and Gutenberg-Richter. Finally, the shape of the isoenergetic lines is analyzed according to the attenuating energy of the seismic waves propagating along and across the strike of main geological structures. (Author)

AD-271 515 Div. 2, 25
(TISTP/FR) OTS price $2.60

Aerospace Information Div., Washington, D. C.
PHENOMENA IN THE UPPER ATMOSPHERE. REVIEW OF SOVIET LITERATURE.
Monthly rept. no. 20 for Dec 61.
31 Dec 61, 20p. incl. illus. 15 refs. (AID rept. no. 61-169)
Unclassified report

DESCRIPTORS: (*Sunspots, Hydrodynamics.) (Sunspots, Theory.) (Ionospheric disturbances, Solar flares.) (*Ionosphere, Ionization.) (Ionosphere, Terrestrial magnetism.) (*Aurorae, Antarctic regions.) (Aurorae, Measurement, Radar, Photometers, Spectrographic analysis, Photographic analysis.) (*Earth, *Electric currents.) Solar atmosphere, *Cosmic rays, *Atmospheric electricity.

Materials deal with the following topics: Solar radiation and the ionosphere, Van Allen belts and cosmic rays, Telluric currents, and Atmospheric electricity. (Author)

AD-271 524 Div. 2, 25
(TISTP/JW) OTS price $6.60

Aerospace Information Div., Washington, D. C.
CELESTIAL MECHANICS AND OPTIMUM METHODS. PART 3. DIFFERENTIAL EQUATIONS WITH DELAYED ARGUMENT (SURVEY OF SOVIET LITERATURE FOR 1957-1960).
20 Dec 61, 63p. 59 refs. (AID rept. no. 61-167)
Unclassified report

DESCRIPTORS: (*Differential equations, Control systems.) USSR, *Celestial mechanics.

Contents:
Solution of various differential equations with delayed argument and properties of these solutions
Stability theory of solutions of differential equations with delayed argument according to Lyapunov
Operational methods of solution of differential equations with delayed argument
Boundary value problems for differential equations with delayed argument
Boundedness criteria for solutions of differential equations with delayed argument
On the theory of oscillating solutions

AD-271 537 Div. 2, 1
(TISTP/WH) OTS price $13.00

Borg-Warner Controls Div., Borg-Warner Corp., Santa Ana, Calif.
ANALYSIS OF NATIONAL AVIATION METEOROLOGICAL REQUIREMENTS THROUGH 1975. APPENDICES.
Final rept.
1 Aug 61, 178p. incl. illus. tables, refs.
(Contract FAA/BRD-139)
Unclassified report

DESCRIPTORS: (*Civil aviation, All weather aviation, *Climatic factors, Meteorology, Meteorological data, Air traffic control systems.)

Contents:
The Wind-Averaging Problem for Aviation Terminal Forecasts, by H. E. Cramer
Predictability in Meterology, by R. C. Sutcliffe
Aircraft Air-Data Processing Systems, by J. C. Bellamy
Quantitative Representation of the Velocity Distribution along the Vertical, by H. Riehl
Human Factors Considerations in Weather Displays for Automated Air Traffic Control Systems, by G. R. Purifoy, Jr.

AD-271 540 Div. 2
(TISTP/GRW) OTS price $1.10

Aerospace Information Div., Washington, D. C.
THE TUNGUSKA METEORITE.
16 Jan 61, 3p. (AID rept. 62-5; Trans. of The Anomalous Optical Phenomena in the Atmosphere Associated with the Fall of the Tunguska Meteorite; Akademiya Nauk SSSR. Komitet po Meteoritam. Meteoritika 20:40-53, 1961)
Unclassified report

DESCRIPTORS: (*Meteorites, Optics, Atmosphere, Optical analysis, Siberia.)

This analysis represents an effort to reconstruct the intensity, duration, and areal extent of the luminous and optical phenomena occurring immediately after the fall of the Tunguska meteorite in Siberia. Particular attention is paid to the period from 28 June to 3 July 1908, and the 114 points at which the phenomena were observed during this period are listed. (Author)

AD-271 541 Div. 2
(TISTP/GRW) OTS price $1.10

Aerospace Information Div., Washington, D. C.
ARTIFICIAL CLOUD DISPERSION.
19 Jan 62, 3p. (AID rept. 62-7; Trans. of Artificial Cloud Dispersion. Priroda, no. 11, pp. 79-83, Nov 61)
Unclassified report

DESCRIPTORS: (*Clouds, Reduction, USSR.) (Solar eclipse, *Visibility, Climatic factors.) (Aircraft, Flight paths, Carbon dioxide, Tests.) Artificial precipitation.

On 15 February 1961, the Institute of Applied Geophysics, Academy of Sciences USSR, undertook the clearing of the skies over the Crimean Astrophysical Observatory and the nearby town of Dzhankoy in preparation for a total eclipse of the sun, whose umbra would pass over these points. Preliminary investigations showed that heavy supercooled clouds driven by fast winds could be dissipated by spraying carbon dioxide very rapidly into individual cloud banks. The total seeding area is divided into unit areas roughly in the form of quandrangles, and each quadrangle is seeded in parallel lines with and against the wind. Seeding time may be reduced by increasing the carbon dioxide dosage and by seeding fewer lines at greater intervals. (Author)

AD-271 543 Div. 2
(TISTP/GRW) OTS price $1.10

Aerospace Information Div., Washington, D. C.
SEA-LEVEL AND ROADSTEAD HYDROLOGICAL OBSERVATIONS IN AND ALONG SOVIET ARCTIC SEAS.
5 Jan 62, 3p. illus. table (AID rept. no. 62-1; Trans. of the Distribution of Representative Marine Hydrological Stations in the Soviet Arctic. Problemy Arktiki; Sbornik Statey, no. 7, pp. 115-124, 1959)
Unclassified report

DESCRIPTORS: (*Hydrology, Oceans, Arctic regions.) (*Oceanographical data, Collecting methods, USSR.) (Oceanographical charts, Kara sea.)

AD-271 544 Div. 2
(TISTP/GRW) OTS price $1.10

Aerospace Information Div., Washington, D. C.
CHANGING THE CLIMATE OF THE ARCTIC.
19 Jan 62, 3p. (AID rept. 62-8; Trans. of Is it Possible to Eliminate the Ice Cover of the Arctic Ocean. Priroda, no. 11, pp. 93-97, Nov 61)
Unclassified report

DESCRIPTORS: (*Climate, Arctic regions.) (Ocean currents, Ice, Melting, Climatic factors.) (Theory, USSR.)

AD-271 557 Div. 2, 1
(TISTP/GRW) OTS price $18.50

Borg-Warner Controls Div., Borg-Warner Corp., Santa Ana, Calif.
ANALYSIS OF NATIONAL AVIATION METEOROLOGICAL REQUIREMENTS THROUGH 1975, VOLUME 2.
Final rept., vol. 2.
1 Aug 61, 1v. incl. illus. tables, refs.
(Contract FAA/BRD-139)
Unclassified report

DESCRIPTORS: (*Civil aviation, All weather aviation, *Climatic factors, Meteorology, Meteorological data, Air traffic control systems.)

To ascertain the weather information required through 1975, investigators examined all aviation operations in the United States and determined first, who the users were and who they would be in the future; second, how weather affected their operations; and third, what combination of their specific requirements would best satisfy the needs of all users. The common requirements were arranged into packages of weather information that would be meaningful in particular operational situations. (Author)

AD-271 558 Div. 2, 1
(TISTP/WH) OTS price $22.25

Borg-Warner Controls Div., Borg-Warner Corp., Santa Ana, Calif.
ANALYSIS OF NATIONAL AVIATION METEOROLOGICAL REQUIREMENTS THROUGH 1975, VOLUME 4.
Final rept. vol. 4.
1 Aug 61, 1v. incl. illus. tables.
(Contract FAA/BRD-139)
Unclassified report

DESCRIPTORS: *Civil aviation, All weather aviation, *Climatic factors, Meteorology, Meteorological data, Air traffic control systems.

The performance required of a common aviation weather system that will provide the weather information necessary in operational aviation is analyzed. The operational requirements for weather information impose these performance requirements: Presenting, Processing, Observing, and Communicating. Each of these subsystems was examined to determine its adequacy in satisfying the operational requirements. (Author)

AD-271 576 Div. 2, 25
(TISTA/SEB) OTS price $.50

National Aeronautics and Space Administration, Washington, D. C.
ROCKET MEASUREMENTS OF THE UPPER IONOSPHERE BY A RADIO PROPAGATION TECHNIQUE,
by S. J. Bauer and J. E. Jackson. Feb 62, 12p. incl. illus. 6 refs. (NASA Technical note D-1123)

Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical note D-1123.

Presented at the International Convention on Radio Techniques and Space Research, Oxford England, July 5-9, 1961, and to be published in the Jnl. Brit. Inst. Radio Engrs., 1962.

DESCRIPTORS: (*Ionosphere, Electrons, Density, Measurement by Radio transmission, Radio waves, Propagation from Sounding rockets, Tests, Mathematical analysis.)

High altitude measurements of the electron density distribution were performed well above the F2 peak of the ionosphere by using the two-frequency rocket-borne propagation experiment of Seddon. An example of a measurement of the electron density profile up to 620 km by means of the CW propagation technique is presented, including the inferred scale height and temperature of the upper ionosphere. For the anticipated measurements up to one earth radius by the CW propagation experiment, the variation of the ionosphere below a vehicle must always be considered to arrive at reliable local electron density data. A correction for this time variation can be made by using recorded information on the ordinary and extraordinary propagation modes at two harmonically related frequencies. This correction procedure is briefly outlined. (Author)

AD-271 609 Div. 2
(TISTP/GRW) OTS price $1.60

Boeing Scientific Research Labs., Seattle, Wash.
EXOSPHERIC ELECTRON TEMPERATURES FROM NOSE WHISTLER ATTENUATION,
by H. B. Liemohn and F. L. Scarf. Dec 61, 15p. incl. illus. table, 9 refs. (Rept. no. D1-82-0143)

Unclassified report

Also available from the author.

DESCRIPTORS: (*Astrophysics, Electrons, Temperature, *Exosphere.) (Cyclotrons, Resonance, Damping, Attenuation, Analysis.)

A recent conjecture that the observed whistler cutoff arises from thermal broadening of the cyclotron resonance was used to evaluate electron temperatures. In the original work very crude data were analyzed with a modified dispersion relation based on the collisionless Boltzmann equation. This thermal analyses was applied to new whistler data of Pope, using each of his assumed density variations and both one and two hop interpretations of the data. (Author)

AD-271 636 Div. 2
(TISTP/FR) OTS price $6.60

Woods Hole Oceanographic Institution, Mass.
WATER VAPOR DISTRIBUTION IN THE SUB-CLOUD TRADE WIND AIR,
Technical rept. no. 47 on Marine Meteorology, by Andrew F. Bunker. Jan 62, 44p. illus. 8 refs. (Ref. no. 62-2)
(Contract Nonr-172100, Proj. NR-082-021)

Unclassified report

DESCRIPTORS: (Bahama Islands, *Atmosphere, *Water vapor, Measurement, Statistical analysis, Wind.)

Observations of the mixing ratio were made simultaneously at three levels in the sub-cloud layer of the trade wind east of the Bahama island of Eleuthera. Three airplanes were equipped with psychrographs capable of yielding significant 3-second averages of the mixing ratio. On 8 days, August 8 to 16, 1960, 41 formation flights were made on east-west or north-south courses, giving 123 series of mixing ratios for analysis. Runs extended over 10 or 20 minutes and the levels were usually 400, 800, and 1200 feet. (Author)

3. CHEMICAL WARFARE EQUIPMENT AND MATERIALS

AD-271 598 Div. 3, 22
(TISTW/JRG) OTS price $2.60

Air Force Proving Ground Command, Eglin Air Force Base, Fla.
FIRST ARTICLE TEST OF THE BLU-1/B FIRE BOMB AND THE FMU-7/B ELECTRIC FUZE SET,
by Dathan R. Kerber. Jan 62, 20p. incl. illus. tables (Rept. APGC TDR 62-5)

Unclassified report

DESCRIPTORS: (*Fire bombs, *Incendiary bombs, *Bomb fuzes, *Electric fuzes, Processing, Loading, Reliability, Flight testing, Safety, Temperature, Pressure, Tests.)

A test was conducted on the first production line BLU-1/B fire bombs and FMU-7/B electric fuze sets. The areas of testing included: (1) General assembly and filling characteristics; (2) compatibility with F-100D and F-105D aircraft; (3) functional reliability; (4) high (600 KIAS) and low (220 KIAS) speed jettisonability from F-100D and F-105D aircraft; (5) safety requirements; and (6) compliance with temperature and pressure requirements. (Author)

4. CHEMISTRY

AD-270 956 Div. 4
(TISTM/EJH) OTS price $6.60

Mellon Inst. of Industrial Research, Pittsburgh, Pa.
(No title).
Technical rept. no. 6, 1 Mar-31 Aug 61.
31 Aug 61, 1v. incl. illus. tables, refs.
(Contract Nonr-269300)
Unclassified report

DESCRIPTORS: (*Polymers, *Ethylenes, Oxides, *Styrenes, Crystals, Crystal structure, Molecular weight, Physical properties, Viscosity, Mechanical properties, Molecular structure, Stability, Synthesis, Polymerization, Free radicals, Ions.) (Test methods, Test equipment, Torsion meters, X-ray diffraction analysis.)

Extension to polyethylene oxide of precise determinations of the height and position of the minima in the potential energy curves on rotation about the valence bonds entailed measurement of the crystalline structure by x-ray diffraction. Progress was made on the design and construction of an instrument for precise measurement of the properties of polycrystalline systems. Methods for anionic synthesis of homogeneous linear polystyrene and star-type branched polystyrene as model systems for study of the physical and mechanical property dependence on molecular weight and its distribution, and on chain branching, are discussed. The preparation and proof of structure of a trifunctional polystyrene of molecular weight 300,000 are reported. An analysis of the effect of chain branching on reducing the melt viscosity of polymers indicates that a lower resistance to flow results because of the smaller size of the domain of a single polymer coil when branched, and the lower efficiency of interchain entanglement for the smaller coils. (Author)

AD-271 105 Div. 4
(TISTM/TCG) OTS price $1.60

Ionics, Inc., Cambridge, Mass.
PURIFICATION OF ORGANIC COMPOUNDS BY MEMBRANE PERMEATION.
Bimonthly progress rept. no. 3, 1 Nov 61-1 Jan 62,
by John L. Eisenmann. 31 Jan 62, 14p. incl. illus. tables, 3 refs.
(Contract DA 18-108-cml-6626)
Unclassified report

DESCRIPTORS: (*Organic compounds, *Hydrocarbons, Liquids, *Purification, Separation.) (Mixtures, Heptanes with Pentanes or Cyclohexanes or Benzenes Cyclohexenes, Ethers.) (Density, Pressure, Physical properties, Chromatographic analysis.) (Semipermeability, Films, Membranes, Polymers, Ethylenes or Propenes.)

Polypropylene and several modifications of polyethylene films were selected as the first membranes to be examined. Permeation runs and selectivity for several binary mixtures through polypropylene and medium density polyethylene are given. Heptane was used as the standard for comparision in each case, and permselectivity and rate were determined for its binary mixture with pentane, dodecane, hexene, cyclohexane, cyclohexene, cyclohexene, benzene, and di-n-butyl ether. Analyses of charge and permeate mixtures were done by vapor phase chromatography. In all pairs of experiments except the cyclohexane-heptane runs, the average permeation rate was at least 3-fold faster through polyethylene than through polypropylene. For the pentane-heptane binary, the permeate pressure had a marked affect on the permselectivity.

AD-271 110 Div. 4, 25
(TISTP/WH) OTS price $2.60

Pennsylvania State U. Mineral Industries Experiment Station, University Park.
HIGH PRESSURE PHENOMENA,
by Frank Dachille and Rustum Roy. 29 Nov 60, 13p. illus. 3 refs. (Technical rept. no. 7)
(Contract Nonr-65620)
Unclassified report

DESCRIPTORS: (Pressure, Chemical reactions.) *High pressure research.

AD-271 116 Div. 4, 13, 31
(TISTM/TCG) OTS price $.50

Naval Research Lab., Washington, D. C.
LABORATORY SCALE OPERATION OF THE SULFATE CYCLE FOR CARBON DIOXIDE REMOVAL AND OXYGEN GENERATION,
by A. L. Pitman and S. T. Gadomski. 17 Jan 62, 12p. incl. illus. tables, 8 refs. (NRL rept. no. 5714)
(Proj. SF 013-08-03)
Unclassified report

DESCRIPTORS: (Laboratory equipment, Production, *Oxygen by Electrolysis, Sulfuric acid and Carbonates, *Carbon dioxide, Absorption, Disposal.) (Electrolytic cells, Design.) Air conditioning, Submarines.

A laboratory-scale sulfate cycle pilot plant was constructed and operated for 70 hr of intermittent service with the last run in this series lasting 24 hr. This joint operation of the major components was satisfactory despite minor difficulties in the electrolyzer, attributed primarily to the diaphragms. The chrysotile asbestos used in the diaphragms, particularly on the anode side, gradually decomposed and then plugged the diaphragms. A diaphragm research group, set up to develop an improved material, has been making satisfactory progress and a solution to this problem is in sight. Current efficiencies for O, H_2SO_4, H, and NaOH were substantially the same in joint operation as in separate electrolyzer operation. The electrolyzer was still operable on completion of the last run, an indication of the over-all reliability of the system. The average O production rate in the joint operation runs was 14.4 l/hr or 0.51 cu ft/hr. In the 24-hr joint operation run the average O output of the electrolyzer was 14.0 l/hr while the average rate of CO_2 removal from the neutralizer was 13.0 l/hr. In the short time of service no trend was observed in either the absorber or neutralizer which could reduce their effectiveness. (Author)

AD-271 121 Div. 4, 25
(TISTM/EJH) OTS price $1.60

Princeton U., N. J.
DIELECTRIC RELAXATION AND STRUCTURE.
Final rept., 7 Jan 59-6 Jan 62,

by Charles P. Smyth. 6 Jan 62, 12p.
(Contract DA 36-034-ORD-2827)
(AROD rept. no. 2364:12)
Unclassified report

DESCRIPTORS: (*Organic compounds, Liquids, Solids, *Molecular structure, *Molecular rotation, Relaxation time, Molecular spectroscopy, *Dielectrics, *Dielectric properties, Dipole moments, Vicosity, Mechanical properties.) (Ethers, Amines, Alkoxy radicals, Benzenes, Alkyl radicals, Halides, Quinolines, Quinones.) Microwave spectroscopy.

Progress was made in understanding the relations between molecular relaxation times and molecular size and shape, dipole location in the molecule, and viscosity of the material. New evidence was obtained on the distribution of relaxation times and the mechanisms involved. The intramolecular rotation of several groups was consistent with their sizes, and the corresponding relaxation times have, in some instances, given concrete evidence of steric repulsion. Evidence was obtained of a shift of electronic charge with rotation of an aromatic ring around its bond to an O atom and, probably, also to a N atom. Analysis of previous measurements on solids showed relationships between dielectric behavior, molecular shape, and plasticity or rigidity of the solid. Microwave measurements of dielectric loss established the non-polarity of seemingly symmetrical molecules. (Author)

AD-271 173 Div. 4
(TISTM/GEC) OTS price $1.60

Florida U. Engineering and Industrial Experiment Station, Gainsville.
FLUOROCARBON N-F COMPOUNDS.
Quarterly technical rept. no. 10, Oct-31 Dec 61,
by J. A. Young and R. D. Dresdner. 31 Dec 61,
8p. incl. tables, 6 refs.
(Contract DA 01-009-ORD-772)
(AROD rept. no. 007.10)
Unclassified report

DESCRIPTORS: (*Fluorocarbons, *Nitrogen compounds, *Fluorides, Chemical reactions.) (Free radicals, Fluorides, Azides, Dissociation, Hydrazines, Pyrolysis, Ultraviolet radiation, Decomposition, Chemical bonds, Stability, Carbonyl radicals, Imides, Fluorination.) (Infrared spectroscopy, Chromatographic analysis.)

F compounds possessing N-N double bonds decomposed generally to give N and free radicals containing no N. Those containing a N-N single bond should, by analogy with N2F4, give N containing free radicals, but this bond was much stronger than covalent bond energies indicated. Perfluorotetramethyl hydrazine underwent little pyrolysis at temperatures below 600 degrees, while pyrolysis of (CF3CO)4N2 left the N-N' bond intact. Reasons for this unusual stability were discussed. Indirect fluorination of (CF3CO)4N2 with AgF2 gave only CF3COF. No N-F compounds were observed. (Author)

AD-271 451 Div. 4
(TISTM/EJH) OTS price $1.10

Inorganic Research Lab., Western Reserve U., Cleveland, Ohio.
SYSTEMS CONTAINING A SILICON-OXYGEN-METAL LINKAGE,
by M. M. Chamberlain, G. A. Jabs and B. B. Wayland. 31 Jan 62, 11p. (Technical rept. no. 2)
(Contract Nonr-143907, Proj. no. NR 052-419)
Unclassified report

DESCRIPTORS: (*Metalorganic compounds, Esters, Phenyl radicals, *Silicones, Thio radicals, *Vanadates, Vanadium compounds, Synthesis, Chemical analysis.)

Methods were developed for the preparation of the vanadium siloxy esters tris(triphenylsiloxy) vanadate and tris(triphenylsiloxy) thiovanadate. Modifications of the reported methods to give high yields of tetrakis(triphenylsiloxy) vanadium are discussed. A quick and accurate method for the quantitative determination of Si and V in these esters was developed.

AD-271 590 Div. 4
(TISTM/GEC) OTS price $1.60

University of Southern Calif., Los Angeles.
THE ABSOLUTE RATES OF SOME FREE RADICAL REACTIONS.
Final rept., 20 Oct 60-19 Oct 61,
by Sidney W. Benson. 19 Oct 61, 10p.
(Grant no. DA-ORD-124-61-G36, Proj. TB2-001(2198))
(AROD rept. no. 2198:10) Unclassified report

DESCRIPTORS: (*Chemical reactions, Reaction kinetics, *Free radicals, *Bibliography.) (Ozone, Organic halides, Alkyl radicals, Hydrogen compounds, Acetyl radicals, Iodides, Propanes, Iodine, Peroxides, Butyl radicals, Acetones, Methyl radicals, Ethers.) (Decomposition, Photolysis, Pyrolysis.)

The following articles are abstracted: On the Existence of Energy Chains of Ozone Decomposition, by S. W. Benson; Kinetics of the Reactions of Alkyl Iodides with HI. by S. W. Benson and E. O'Neal; Reaction of Cyclopropane with Iodine and Some Observations of Isomerization of Cyclopropane, by S. W. Benson; The Pyrolysis of Di-Tertiary Butyl Peroxide. Temperature Gradients and Chain Contribution to the Rate, by L. Batt and S. W. Benson; Photolysis of Acetone in the Presence of HI. The Kinetics of Decomposition of the CH3CO Radical, by E. O'Neal and S. W. Benson; Termination Products in the Pyrolysis of Dimethyl Ether, by K. Anderson and S. W. Benson; Kinetics of the Reaction of Acetyl Iodide with HI and the I2-Induced Decomposition of CH3CHO. by S. W. Benson and E. O'Neal; HCl-Catalyzed Pyrolysis of Ditertiary Butyl Peroxide, by S. W. Benson, L. Batt, and M. C. Flowers; The Pyrolysis of Organic Iodides, by S. W. Benson.

AD-271 592 Div. 4
(TISTM/EJH) OTS price $.50

Wyandotte Chemicals Corp., Mich.
ORGANIC PERCHLORATE ESTERS.
Rept., June 60-Feb 61 on Chemistry and Physics of Materials,
by Jack Radell and J. W. Connolly. May 61, 8p.
incl. illus. tables, 11 refs.
(Contract AF 33(616)5937)
(ASD TR 61-109) Unclassified report

DESCRIPTORS: (*Esters, *Alkyl radicals, *Perchlorates, Synthesis, Chemical reactions, Alkyl radicals, Iodides, Silver compounds, Perchlorates, Complex compounds, Urea, Molecular structure, Stability.) (X-ray diffraction analysis, Infrared spectroscopy.) Explosives.

The previously unreported n-amyl, n-hexyl, n-heptyl and n-octyl perchlorates were prepared from the corresponding alkyl iodide and AgClO4. The pure perchlorate esters were stabilized as the endocyte of a urea inclusion compound. The IR spectra and some physical properties are reported for the n-alkyl perchlorates. (Author)

AD-271 594 Div. 4, 25
(TISTM/EJH) OTS price $.75

Directorate of Materials and Processes, Aeronautical Systems Div., Wright-Patterson Air Force Base, Ohio.
X-RAY DIFFRACTION STUDY OF STRAIGHT CHAIN CARBOXYLIC ACIDS (C11 TO C14).
Rept. for Jan 59-July 61, on Materials Analysis and Evaluation Techniques,
by William L. Baun. Nov 61, 19p. incl. illus. tables, 19 refs.
(Proj. 7360)
(ASD TR 61-442) Unclassified report

DESCRIPTORS: (*Fatty acids, Organic acids, *Carboxylic acids, Formic acids, Propionic acids, Octanoic acids, Capric acids, Acetic acids, Valeric acids, X-ray diffraction analysis, Crystal structure, Crystals, Molecules, Thermal expansion.) (Organic acids, Butanes, Heptanes, Hexanes, Octanes.) (Solids, Liquids, Mixtures.)

X-ray diffraction effects in solid state saturated fatty acids are presented with emphasis on short chain fatty acids normally liquid at room temperature. Long and short spacings are determined, anisotropic thermal expansion is shown, polymorphic tendencies are investigated, and other variable temperature effects are discussed. (Author)

5. COMMUNICATIONS

AD-270 971 Div. 5
(TISTE/CRJ) OTS price $2.60

General Dynamics/Electronics, Rochester, N. Y.
FORMANT VOCODER SPEECH COMPRESSION SYSTEM (EXPERIMENTAL MODEL).
Quarterly rept. no. 1, 1 July-30 Sep 61,
by L. C. Stewart. 30 Oct 61, 21p.
(Contract DA 36-039-sc-87252, Proj. 3B31-01-001)
Unclassified report

DESCRIPTORS: (*Speech, *Speech transmission, *Voice communication systems, Multiplex transmission, Coding.) (Data processing systems, Digital systems, Circuits.)

Efforts are being made to construct an experimental model Formant Vocoder Speech Compression System. The design objective is a 1500 bit-per-second system having a minimum articulation index of 80% for a phonetically balanced word list. (Author)

AD-271 026 Div. 5, 8
(TISTE/CRD) OTS price $9.60

Sylvania Electric Products, Inc., Waltham, Mass.
INVESTIGATION OF ANTENNA SYSTEMS FOR SCATTER-TYPE RECEPTION.
Final rept. for Mar 60-June 61 on Theory of Antenna Performance in Scatter-Type Reception.
Oct 61, 1v. incl. illus. table, 17 refs. (Rept. no. F476-1)
(Contract AF 19(604)7237)
(AFCRL-742) Unclassified report

DESCRIPTORS: (*Antennas, *Antenna radiation patterns, *Radio communication systems, *Radio signals, Design.) (Radio waves, Atmosphere, Scattering, Tracking, Theory, Measurement, Statistical analysis, Effectiveness, Configuration.) (Microwaves, Radio transmission, *Radio reception, Diversity systems.)

This rept. includes:
MONTE CARLO EVALUATION OF THE TRACKING ANTENNA, by Donald E. Johansen. 1961, 75p. incl. illus. (Rept. no. ARM-257)

ON THE GENERATION OF CORRELATED GAUSSIAN SAMPLES, by Donald E. Johansen. 1961, 22p. 8 refs. (Rept. no. ARM-263)

A Monte Carlo evaluation is presented of the performance of a tracking antenna system in a scatter-type reception situation. The antenna analyzed tracks, with zero time lag, on the fluctuating angle of arrival of radio signals. The analysis evaluates performance statistics relating to the associated time-varying received power. It is concluded from this theoretical study that the use of a steerable antenna is comparable in principle to use of a high order angle diversity system with the same size aperture. The results indicate that the choice of one or the other is likely to vary with application requirements, and engineering problems of construction. (Author)

AD-271 037 Div. 5, 12
(TISTW/DLW) OTS price $3.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
SATELLITE TO SATELLITE COMMUNICATIONS: A LITERATURE SURVEY OF RECENT TECHNIQUES,
comp. by Jack B. Goldmann. Oct 61, 32p. 93 refs.
(Special bibliography no. SB-61-59; Rept. no. 3-77-61-18)
(Contract AF 04(647)787)
Unclassified report

DESCRIPTORS: (*Radio communication systems, Communication systems, Military communications, Air force communications, Radio relay systems, *Satellite vehicles, Airborne, *Bibliography.)

An annotated bibliography is presented on satellite to satellite communications techniques which includes publications released from January 1960 to June 1961. The survey considers communication satellites to be an integral part of satellite to satellite communications. Emphasis is placed upon active satellites. References to the Echo satellite are omitted. (Author)

AD-271 111 Div. 5
(TISTE/NTM) OTS price $10.50

National Cash Register Co., Dayton, Ohio.
HIGH FREQUENCY DIGITAL COMMUNICATION SYSTEM.
Quarterly engineering rept. no. 2, 1 Sep-30 Nov 61.
30 Dec 61, 1v. incl. illus. tables (Rept. no. 3-2Q)
(Contract AF 33(600)42197)
Unclassified report

DESCRIPTORS: (*Communication systems, High frequency, *Radio communication systems, *Digital systems, Airborne, Ground support

equipment, Design.) (Data transmission systems, Synchronizers, Band-pass filters, Radio-frequency filters, Signal-to-noise ratio, Piezoelectric crystals, Crystal filters, Automatic volume control.) (Digital computers, Circuits, Trigger circuits, Electronic circuits, Synthesis, Tests, Reliability.)

Research concerns the design, fabrication, reliability testing, and maintenance of airborne and ground station digital equipment which will operate with other data systems utilizing standardized message format parameters. Bandpass filters, synchronization techniques, and automatic gain control techniques are discussed in detail and a functional description of the system, illustrated with block diagrams, is included. Progress made in the development of individual circuits is described; schematic diagrams of many of these circuits are included. A packaging philosophy, and a summary of the results of reliability testing, are given. (Author)

AD-271 194 Div. 5
(TISTE/NTM) OTS price $6.60

Philco Corp., Philadelphia, Pa.
TSEC/HY-2 CHANNEL VOCODER, MODIFIED.
Quarterly rept. no. 2, 1 Sep-30 Nov 61, by P. E. McChesney. 30 Nov 61, 56p. incl. illus. tables.
(Contract DA 36-039-sc-87215, Proj. 3B31-07-001)
Unclassified report

DESCRIPTORS: (*Speech, *Speech transmission, *Speech representation, *Electronic equipment, Synthesis, Coding, Design.) (*Voice communication systems, Data transmission systems, Printed circuits, Electronic circuits, Timing circuits, Band-pass filters, Analog systems, Digital systems, Design.)

Research was continued on the development of the modified Vocoder. All digital circuit design was completed and the individual circuits are presented. The modular circuits that will be used in the modified Vocoder are given. All efforts were made to simplify the circuitry by utilizing modular circuitry wherever possible. Filters for the modified Vocoder will be the plug-in type for ease of interchangeability. Their electrical characteristics will be identical to those used in the TSEC/HY-2 Vocoder. Specification for all filter types are presented. (Author)

AD-271 411 Div. 5, 1
(TISTE/EJH) OTS price $5.60

Electrical Engineering Research Lab., U. of Texas, Austin.
POWER SPECTRUM AND CORRELATION FUNCTION EVALUATION OF SELECTED TOWER REFRACTOMETER MEASUREMENTS,
by G. B. Walker. 29 Dec 61, 48p. incl. illus. tables, 22 refs. (Rept. no. 6-43)
(Contract AF 19(604)8038, Proj. 5631)
(AFCRL-1106) Unclassified report

DESCRIPTORS: (*Radio waves, Atmosphere, *Wave transmission, Propagation, Scattering, Refractive index, Theory, Mathematical analysis.) (Refractometers, Analog computers, Telemetering data.)

Measurements of atmospheric refractive index fluctuations in the boundary layer near the earth are reported. Recently developed telemetering refractometers were employed which allow direct recording of information on magnetic tape thereby reducing errors previously associated with these types of measurements. The data obtained were subjected to statistical analysis by analog techniques to obtain power density spectra and correlation functions. The results of the statistical analysis were compared with theoretical functions; agreement is indicated. Height dependence of the slope of the power density spectra and standard deviation are included. (Author)

AD-271 518 Div. 5, 8, 12
(TISTE/EJH) OTS price $.75

National Aeronautics and Space Administration, Washington, D. C.
INITIAL INVESTIGATION OF MONOPOLE ANTENNA SYSTEMS FOR USE ON SPHERICAL METAL SATELLITES,
by Roland R. Ford and Louis F. Schmadebeck. Feb 62, 26p. incl. illus. table (NASA Technical note D-1077)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA TN D-1077.

DESCRIPTORS: (*Satellite vehicle antennas, *Telemetering antennas, Antennas, Design.) (Satellite vehicles, Spaceships, Spheres, Communications systems.)

To obtain improved omnidirectional tracking, telemetry, and command communication coverage for future satellites, several monopole antenna systems were investigated with a view to minimizing nulls in the antenna pattern coverage. A conventional modified turnstile antenna used on spherical satellites, and various unconventional arrangements of feed and passive monopoles in pairs were investigated. Two different monopole arrangements provide a 10 db improvement in antenna pattern nulls as compared to the conventional turnstile. These results imply that the turnstile technique can be improved, and that the 2 systems recommended here are worthy of further consideration. (Author)

AD-271 549 Div. 5, 18, 28
(TISTB/LH) OTS price $10.10

Laboratories for Research and Development, Franklin Inst., Philadelphia, Pa.
PEOPLE, ORGANIZATIONS AND COMMUNICATIONS. AN OPERATIONS RESEARCH STUDY OF ARMY COMMUNICATIONS. PHASE II. DATA COLLECTION INSTRUMENTS.
Interim rept.,
by Richard M. Williams, Clifton E. Mayfield, and Joel N. Bloom. Dec 61, 106p. incl. illus. tables (Rept. no. I-A2313-4)
(Contract DA 36-039-sc-78332)
Unclassified report

DESCRIPTORS: (*Communication systems, *Military communications, *Operations research, Collecting methods, Data, Military organizations, Information theory.) (Human engineering, Errors, Reliability.)

The data collection instrumentation required to support an operations research program aimed at investigating the principle interrelationships of people, organizations, and equipment in army communications systems is described. The requirements for data are discussed and specific

instruments are evolved to describe the army communications system in quantifiable terms, to statistically estimate the parameters of the system analysis model, and to evaluate the acceptability of alternate communications systems. Instrumentation for the measurement of the actual system, the assessment of the staff officers' perceptions of the system, the detection of critical incidents, and the conduct of simulation is considered. The principal data collection program - Headquarters delay and error measurement - is presented in some detail, as are the necessary support procedures. (Author)

AD-271 612 Div. 5, 15
(TISTW/DLW) OTS price $3.60

Montana State Coll., Bozeman.
TRANSIENT BEHAVIOR IN ITERATIVE COMBINATIONAL SWITCHING NETWORKS,
by W. L. Kilmer. July 61, 28p. incl. illus. 10 refs. (Scientific rept. no. 2)
(Contract AF 19(604)6619)
(AFCRL-592) Unclassified report

DESCRIPTORS: (*Switching circuits, *Communication systems, Statistical processes, Groups Mathematics), Transformations (Mathematics), Sequential analysis, Mathematical logic, Analysis, Synthesis, *Combinatorial analysis, Transients.)

Switching networks are discussed which consist of n identical combinational logic cells interconnected from left to right by alpha communication channels into linear arrays. The synchronous cells in these networks have unit switching delays separating their receipts of external x and left-neighbor alpha inputs from their corresponding productions of external z and right-neighbor alpha outputs. Three basic types of alpha transient behavior are discussed for such networks. In all three cases, necessary and sufficient conditions are given of the type of alpha logic allowed. These conditions are expressed in terms of corresponding alpha state graph structure. The main results hinge on certain properties of a new type of state subgraph, and on an indirect application of permutation groups to the state-pair transition problem. (Author)

6. DETECTION

AD-271 062 Div. 6
(TISTW/DLW) OTS price $2.60

Antenna Lab., Ohio State U. Research Foundation, Columbus.
STUDY OF THERMAL MICROWAVE AND RADAR RECONNAISSANCE PROBLEMS AND APPLICATIONS.
Final engineering rept., 1 July 60-30 Sep 61. 1 Oct 61, 21p. incl. illus. tables, 21 refs.
(Rept. no. 898-17)
(Contract AF 33(616)6158, Proj. 0(10-4075)
Unclassified report

DESCRIPTORS: (*Aerial reconnaissance, *Extraterrestrial bases, *Radiometers, Thermal targets, Thermal radiation, Microwaves, Terrain, Wave transmission, Reflection, Detection, Scattering, Attenuation, Military intelligence, Feasibility studies.) (Antiradar coatings, Radar echo areas, Temperature, Radar targets, Measurement.)

Theoretical and experimental studies of the apparent temperature of an isolated object in a thermal background are discussed. Theoretical studies show that the 2 components of apparent temperature of such an object (emission and scattering) can both be calculated from the complete bistatic scattering pattern of the body. Experimentally, 2 radiometers, at 3 cm and 4 mm were constructed, and the former was used to measure the apparent temperature of a controlled target under several conditions. The feasibility of radiometers for surveillance is discussed, including the effects of target velocity and fluctuations in background temperature. (Author)

AD-271 124 Div. 6, 8, 30
(TISTE/TCG) OTS price $9.10

Radiation, Inc., Melbourne, Fla.
TELEMETRY TRANSDUCER HANDBOOK.
Monthly progress rept., 15 Dec 61-15 Jan 62, by H. F. Fisher, Jr. 22 Jan 62, 1v. incl. illus.
(Contract AF 33(616)8309, Proj. 4107)
(WADD TR 61-67, vol. 2, supp. 2)
Unclassified report

DESCRIPTORS: (*Handbooks, *Telemeter systems, *Transducers, Parts catalogs.) Bibliography, Indexes.

AD-271 184 Div. 6
(TISTW/RD) OTS price $22.25

Massachusetts Inst. of Tech., Cambridge.
INITIAL STUDIES ON UNDERGROUND NUCLEAR DETECTION WITH SEISMIC DATA PREPARED BY A NOVEL DIGITIZATION SYSTEM.
Rept. on Proj. VELA-UNIFORM,
by S. M. Simpson, Jr. 30 June 61, 1v. incl. illus. tables (Scientific rept. no. 1)
(Contract AF 19(604)7378)
(AFCRL-863) Unclassified report

DESCRIPTORS: (*Detection of *Underground explosions, *Nuclear explosions with Digital computers from Data on Earthquakes.) (Magnetic recording systems, Digital recording systems, Digital systems, Seismic waves.)

A semi-automatic paper record digitization system, developed by the project was applied to a number of seismic records resulting from the Logan and Blanca nuclear shots. Data for 27 records digitized at 1/20 sec increments and for 34 earthquake records adapted from digitizations of Bruce Bogert are presented. Rough measures of microseismic noise amplitude show inverse correlation with distance from nearest ocean. Two spectral estimations near the coast show narrow lines at 1, 1.4, and about 2.9 cps in the vertical whereas at a three component inland station the noise was primarily concentrated below 1 cps, with small peaks at higher frequencies appearing on the horizontals only, suggestive of Love waves. A test for the presence of Rayleigh waves on this three component record, narrow band filtered at 1/4 cps failed to show any, a possible explanation being barometric coupling to the vertical instrument. (Author)

AD-271 454 Div. 6, 22, 15, 30
(TISTP/TL) OTS price $18.50

Drexel Inst. of Tech., Philadelphia, Pa.
RESEARCH STUDY ON RESOLUTION IMPROVEMENT.

Final rept. on Phase B.
1962, 1v. incl. illus. tables, 38 refs.
(Contract DA 44-009-eng-4141)
Unclassified report

DESCRIPTORS: (*Magnetic detectors, *Mine detectors, Theory, Signal-to-noise ratio, *Electric filters, *Data processing systems, Linear programming, Digital computers, Mines, Detection, Errors.) (Numerical methods and procedures, Integral transforms, Calculus of variations, Matrix algebra, Special functions, Partial differential equations, Integral equations, Taylor's series, Operators (Mathematics), Algebra, Geometry.)

A method for studying the improvement of resolution of a scanning aperture by use of a filter in terms of the consequent degradation of signal-to-noise ratio, the effect of scanning errors on this result, and the application of these results to a special type of aperture theoretically corresponding to a certain type of mine detector are presented. The resolution improvement was studied in terms of the width of the response to a point object. The problem of determining the optimum response for fixed signal-to-noise ratio was reduced to that of solving a singular eigenvalue problem by use of the calculus of variations and Fourier transform techniques. Computer programs for calculating approximations to optimum filters and to the various quantities of interest were developed. These programs were tested and run to varying degrees with synthetic aperture functions, yielding results in general agreement with the theory. Calculations led to conjectures concerning maximum resolution improvements attainable with a given aperture and the corresponding filters. (Author)

AD-271 531 Div. 6
(TISTW/DLW) OTS price $4.60

Electrical Engineering Research Lab., U. of Illinois, Urbana.
STUDIES AND INVESTIGATIONS LEADING TO THE DESIGN OF A RADIO DIRECTION FINDER SYSTEM FOR THE MF-HF-VHF RANGE.
Quarterly rept. no. 1, 1 July-30 Sep 61,
by A. D. Bailey, J. D. Dyson, and E. C. Hayden.
31 Oct 61, 38p. incl. illus. table (Rept. no. 9)
(Contract DA 36-039-sc-87264, Continuation of Contract DA 36-039-sc-84525)
Unclassified report

DESCRIPTORS: (*Direction finding, Medium frequency, High frequency, Very high frequency, *Radio receivers, Antennas, Doppler systems, Radio equipment, Design, Tests.) (Radio waves, Ionospheric propagation, Phase measurement.)

Studies and investigations were made which will lead to the design of a radio direction finding system for the MF-HF-VHF range. The traveling-wave antenna RDF system was operated in the field, and performance data are included. The source of instability in the counter circuits for the pulse waveform modulators was found. Work was continued on a special purpose analog calibrator for the SADIST system. Additional improvements were also made in the panoramic RDF system. Problems in the development of a VHF/UHF antenna are discussed. (Author)

AD-271 584 Div. 6
(TISTE/DLW) OTS price $1.10

Diamond Ordnance Fuze Labs., Washington, D. C.
HIDDEN TRANSMITTER LOCATION BY PULSE ARRIVAL MEASUREMENTS,
by Walter J. Brinks. 22 Mar 61, 13p. incl. illus. (DOFL rept. no. TR-907)
Unclassified report

DESCRIPTORS: (*Direction finding, Position finding, *Radar transmitters, Radar interception, Radar reflections, Radar pulses, Angle of arrival, Pulse analyzers, Theory, Errors, Feasibility studies.)

A method is presented for determining the location of an uncooperative radar transmitter by timing the pulses of the transmitter after they have been reflected or transduced by a moving target of known location. A procedure is discussed for assessing the errors involved. (Author)

AD-271 626 Div. 6
(TISTW/DLW) OTS price $4.60

Straza Industries, El Cajon, Calif.
DESIGN, DEVELOPMENT AND CONSTRUCTION OF ONE ELECTROLUMINESCENT SONAR DISPLAY.
Quarterly interim development rept., 1 Sep-31 Dec 61,
by A. D. Gomez. 31 Dec 61, 39p. incl. illus. tables.
(Contract NObsr-85430)
Unclassified report

DESCRIPTORS: (*Display systems, *Sonar, Sonar equipment, Optical filters, Luminescence, Brightness, Solid state physics, *Photoconductivity, Thin films, Materials, Coatings, Design, Test equipment, Production, Tin compounds, Oxides.)

Display processing studies were conducted to gain a better understanding of the physical and electrical properties of the various layers to be incorporated in the display device. Work was performed on the NESA layers and their processing, on the photoconductive layer, and on the measurement of the EL brightness vs. voltage for the determination of the electrical properties of the support electronics. Display technology efforts included finalizing the fabrication techniques and chemical etching of the NESA films to the required geometry. The proposed technique for connection to the display and the current technology in the preparation of the optical cross-talk layer were studied. The philosophy and the initial design phases for the sustained supply and the analyzer amplifiers are presented. The optical programmer for the azimuth information to the display is also discussed. (Author)

7. ELECTRICAL EQUIPMENT

AD-270 944 Div. 7, 26
(TISTE/GEC) OTS price $2.60

Sprague Electric Co., North Adams, Mass.
PRODUCTION ENGINEERING MEASURE FOR SUBMINIATURE TEMPERATURE-COMPENSATING CERAMIC CAPACITORS.
Quarterly rept. no. 2, 12 Sep-12 Dec 61,
by J. H. Fabricius and W. F. Bell. 12 Dec 61,
18p. illus. tables.
(Contract DA 36-039-sc-85996)
Unclassified report

DESCRIPTORS: (*Ceramic capacitors, *Subminiature electrical equipment, Materials, *Manufacturing methods, Production.) (Capacitors, Ceramic materials, Powders, Dielectrics, Sprays, Coatings, Binders.)

Progress toward selecting ceramic formulations for use in the capacitors required under this contract was described. Attainment of the temperature coefficient of capacitance requirement for the NPO formulation remained a problem. Improved precoating of ceramic power was instituted in preparation for experimental spraying. A stable dip coating system was selected. Progress in the development of slicing, dipping, firing, edge-grinding and -abrading, electrode pickup material application, lead attachment, and assembly techniques was described. Jigs were built and underwent refinement for use in the slicing, dipping, edge-grinding and -abrading, electrode pickup material application, and assembly processes. Production personnel were being trained. (Author)

AD-270 982 Div. 7, 14
(TISTM/GEC) OTS price $2.60

Westinghouse Electric Corp., Pittsburgh, Pa.
INORGANIC BINDERS FOR C CORES.
Progress rept. no. 3, 30 Sep-29 Dec 61,
by J. Seidel. Jan 62, 21p. incl. illus. tables, 3 refs. (Materials Lab. rept. no. 6243-46902-C)
(Contract Nobsr-85304)
Unclassified report

DESCRIPTORS: (*Magnetic cores, *Magnetic materials, Metal films, Steel, Ceramic coatings, Glass, *Binders, Viscosity, Thermal expansion.) (Metal films, Nickel plating, Electroplating, Processing.) (Ceramic coatings, Glass, Silicon compounds, Sodium compounds, Titanium compounds, Zirconium compounds, Oxides.)

Cores were constructed with inorganic binders by fusing a 0.0002 in. layer of glass to the surfaces of magnetic steel strips and winding the composite until the required build-up is attained. The viscosity of the glass was adjusted so that, during the requisite stress relief anneal of the cores, a laminar bond between the adjacent glassy layers was accomplished. A viscosity of approximately 10 to the 7th power poises at 800 C was required. To obtain a core free from residual stresses, the glass was required to match the thermal expansivity of grain-oriented Si steel (approximately 13.2 x 10 to the -6th power/C). The problem in obtaining a composition with both a high viscosity and a high thermal expansivity is being solved by the synthesis of silicate glasses in the system $R_2O.X(RO+R_2O_3+RO_2).(3-X)SiO_2$. Processes for the surface preparation of the magnetic material for binder application were developed and tested. A suitable slip for binder application was formulated. Binders were applied and toroidal cores were wound by commercial equipment. (U) (Author)

AD-271 005 Div. 7, 4
(TISTM/GEC) OTS price $1.10

Pennsylvania State U. Mineral Industries Experiment Station, University Park.
REDOX FUEL CELLS.
Quarterly progress rept. no. 7, 1 Sep-1 Dec 61,
by L. G. Austin. 1 Dec 61, 4p. incl. table.
(Contract DA 49-186-502-ORD-917)
Unclassified report

DESCRIPTORS: (*Fuel cells, Oxidation-reduction reactions, *Tin compounds, Chlorides, Hydrochloric acid, Formaldehyde, Heating.) (Mass spectroscopy, Quantitative analysis, Gases, Carbon dioxide, Methanes, Carbon compounds, Oxides.) *Power supplies, Electrochemistry.

A high pressure build-up occurred when stannic in HCl solutions were heated with formaldehyde at 200C. A mass-spectrographic analysis of this gas was performed. The principal products were CO_2 and CH_4. No H was found in the gas, although appreciable amounts of CO were found. Further titrations have not given any evidence for appreciable reduction of stannic to stannous Sn. (Author)

AD-271 180 Div. 7
(TISTE/NTM) OTS price $1.60

National Carbon Co., Inc., Cleveland, Ohio.
FEASIBILITY STUDY ON HIGH PERFORMANCE, SHORT DURATION POWER BATTERIES.
Quarterly technical progress rept. no. 14, 15 Sep-15 Dec 61,
by E. M. Klopp, M. L. Kronenberg and S. Senderoff. 15 Dec 61, 11p. incl. table.
(Contract NOrd-18240)
Unclassified report

DESCRIPTORS: (Feasibility studies, *Primary batteries, *Power supplies.) (Pulse height analyzers, Scintillation counters, Radioactivity, Silver compounds, Chlorides, Potassium compounds, Lithium compounds, Chlorides.) (*Cathodes (Electrolytic cell), Copper compounds, Sulfides, Iron compounds, Sulfides, Degasification.)

Research was continued on the program designed to determine the feasibility of producing a very high power density battery system. The use of a pulse height analyzer along with a scintillation detector to determine the radioactivity of AgCl in KCl-LiCl melt after diffusion has given reproducible results. Using this technique, the diffusion coefficients obtained were 9.40 x 0.000001 at 825 C; 5.15 x 0.000001 at 635 C; and, 2.12 x 0.000001 at 490 C. Test cells made with $CuSO_4$ as the depolarizer have consistently given power outputs of 300 WH/lb based on active material. $CuSO_4$ depolarized cells delivered 3.6 amp/sq in. for 15 seconds at 1.1-v, followed by 93% recovery of open circuit voltage within 2 seconds. A 2 cell, $CuSO_4$ depolarized battery had an open circuit voltage of 4.95-v and a peak load voltage of 2.6-v at 1.47 amp/sq in. Cells made with $Fe_2(SO_4)_3$ as the depolarizer have given less power, due principally to internal shorting. (Author)

AD-271 358 Div. 7, 25, 14
(TISTM/GEC) OTS price $5.60

Spectrolab, Inc., North Hollywood, Calif.
INVESTIGATION OF OPTICAL COATINGS FOR SOLAR CELLS.
Semi-annual rept. no. 2, 1 July-31 Dec 60,
by A. E. Mann. 30 Dec 60, 49p. incl. illus.
(Contract DA 36-039-sc-85284)
Unclassified report

DESCRIPTORS: (Satellite vehicles, Power supplies, Silicon, *Solar cells, *Optical coat-

ings, *Infrared filters, Theory.) (Tests, Thermodynamics, Wave transmission, Reflection, Blackbody radiation, Space environmental conditions, Stability, Radiation effects, Beta particles, Infrared radiation.) (Rare earth, *Rare earth compounds, Fluorides, Oxyfluorides.) (Coatings, Vapor plating.) (Resin adhesives, Bonding.)

The use of spectrally selective coatings as filters for Si solar cells is under investigation with primary emphasis on auxiliary power systems for space vehicles. A general study of the thermal balance of a solar panel in space and the resultant effect on array efficiency were examined. The diffuse spectral reflectances and spectral sensitivities of typical Si cells are being redetermined. The physical properties and environmental characteristics of state-of-the-art coatings are being studied and measurements of the spectral transmittance, reflectance and emittance for cell coatings are being obtained. Environmental tests included humidity, high- and low-temperature storage, temperature shock, vacuum storage and UV and beta irradiation. Adaptation of the Spectrolab IR window coating to Si solar cells is being studied. (Author)

8. ELECTRONICS AND ELECTRONIC EQUIPMENT

AD-270 918 Div. 8
(TISTE/CRJ) OTS price $3.60

Washington U., Seattle. Coll. of Engineering.
FREQUENCY SCANNING OF SLOW WAVE ANTENNAS,
by Akira Ishimaru and Chyang Hsieh. Aug 61, 30p. incl. illus. 9 refs. (Technical rept. no. 57)
(Contract AF 19(604)4098)
(AFCRL-797) Unclassified report

DESCRIPTORS: (*Slot antennas, X band, Antenna radiation patterns, Attenuation, Measurement, Mathematical analysis.) (Antennas, *Waveguide slots, Microwave equipment, Microwaves, Propagation, Electromagnetic properties, Electromagnetic fields.)

An experimental study is presented of a frequency scanning antenna. The slow wave structure employed is a rectangular waveguide containing corrugations on the bottom of the guide. The propagation characteristics of the allowable mode configurations which can exist inside this structure were solved under the assumption of average constant impedance on the top surface of the corrugations. The slow wave antenna is constructed by cutting slot arrays on the broad side of this waveguide with the long dimension of the slots along the corrugations and with spacings between adjacent slots equal to the guide wavelength at the center frequency. Frequency scanning characteristics of the slow wave antenna were studied by taking radiation patterns for different frequencies. Results show that the angle at which the main beam occurs can be scanned from -72 to 28 degrees by changing the frequency between 9.3 and 10.5 kmc. (Author)

AD-270 975 Div. 8, 26
(TISTE/NTM) OTS price $3.60

RCA Industrial Tube Products, Lancaster, Pa.
PRODUCTION ENGINEERING MEASURE TUBE TYPE A2582A (RCA 7801).
Quarterly rept. no. 5, 1 July-30 Sep 61, by Ben Sheren. Sep 61, 35p. incl. illus. table.
(Contract DA 36-039-sc-85947)
Unclassified report

DESCRIPTORS: (*Electron tubes, Electrodes, *Manufacturing methods, Production, Processing, Design, Tests, Test equipment, Test methods.)

Investigations are concerned with establishing manufacturing facilities required to produce a minimum of 100 tubes per month of type A-2582A. The basic investigation of the spray technique for cathode grid spacing is complete and is in use in developmental production. A viscosity test is described to check the composition of the Lucite spray mixture. One of the two 3000 mc life test equipments was completed and evaluated. The capability to produce type A2582A in the factory is virtually complete. Tubes are in production at very low yield.

AD-270 995 Div. 8
(TISTE/CRJ) OTS price $3.60

New York U. Coll. of Engineering, N. Y.
STUDY OF SHORT TERM STABILITY OF CRYSTAL OSCILLATORS.
Quarterly rept., 1 July-30 Sep 61, by J. Rarity, L. Saporta, and G. Weiss. 30 Sep 61, 38p. incl. illus. (Rept. no. 5)
(Contract DA 36-039-sc-87450; Continuation of Contract DA 36-039-sc-85376, Proj. 3A-99-15-021-02-02)
Unclassified report

DESCRIPTORS: (*Crystal oscillators, Phase modulation, Frequency modulation, *Noise (Radio), Statistical analysis, Mathematical analysis.) (Oscillators, Radiofrequency filters, Radiofrequency, Stability, Signal-to-noise ratio, Phase studies, Correlation techniques.) (Frequency analyzers, Noise analyzers.)

The investigation concerns the factors affecting short term frequency stability of crystal oscillators. A study is presented of the statistics of phase and frequency variations of a sine wave introduced by the action of various types of noise. The noise models considered include narrow band additive noise of single stage, two stage, and Gaussian power spectrum. This is shown to be equivalent to phase modulation by the quadrature component of the noise. The same noise models are also used in a random walk sense. That is, the effects of the noise on the phase of the oscillator are cumulative. It is shown that this is equivalent to a frequency modulation by the quadrature component of the noise. Curves showing the standard deviation of the observed frequency of the sine wave as a function of the observation time are presented for each case. (Author)

AD-271 010 Div. 8, 15
(TISTE/CRJ) OTS price $5.60

Brown U., Providence, R. I.
EQUIVALENT CIRCUIT PARAMETER FOR AN INHOMOGENEOUS BIFURCATED WAVEGUIDE,
by H. M. Cronson. Sep 61, 35p. illus. 3 refs.
(Scientific rept. no. AF 4561/13)
(Contract AF 19(604)4561)
(AFCRL-[illegible]) Unclassified report

DESCRIPTORS: (*Waveguides, Dielectrics, Electromagnetic properties, *Electromagnetic theory, Wave transmission, Impedance, Harmonic analysis, Operators (Mathematics), Transformations (Mathematics), Integral transforms.) (Waveguides, *Electromagnetic waves, Propagation, Mathematical analysis.)

An approximate solution for an equivalent circuit representation of a two dimensional waveguide junction is obtained over several ranges of significant parameters. The junction is formed by a semi-infinite, dielectric filled, parallel plate guide contained symmetrically within an infinite parallel plate guide. The structure is first reduced to a half-space problem and formulated in terms of the appropriate field modes in each of the parallel plate guides forming the junction. These modes are matched at the plane of discontinuity and the resulting equations rearranged to resemble ordinary circuit equations. The circuit elements of the equivalent circuit representation are identified from the equations. The determination of the values of these elements requires the solution of an infinite set of inhomogeneous algebraic equations. Solutions are obtained by approximate methods with the aide of an IBM 7070 computer. The approximate solutions are checked by comparing the results obtained for the degenerate case, in which the dielectric vanishes, with known exact results. This check suggests that the approximate results for the case of non-vanishing dielectric should be within a few per cent of the correct values. (Author)

AD-271 035 Div. 8
(TISTB/AW) OTS price $8.10

Lockheed Aircraft Corp., Sunnyvale, Calif.
PRINTED CIRCUITS AND WELDED MODULES: AN ANNOTATED BIBILIOGRAPHY,
comp. by George E. Owens. Aug 61, 82p.
248 refs. (Special bibliography no. SB-61-52; Rept. no. 3-35-61-1)

Unclassified report

DESCRIPTORS: (*Bibliography, *Printed circuits, Manufacturing methods.)

AD-271 046 Div. 8
(TISTE/GEC) OTS price $1.60

Lockheed Microsystems Electronics, Sunnyvale, Calif.
STRAY CAPACITANCE IN THIN FILM CIRCUITS,
by W. W. Happ. 1961, 13p. incl. illus. tables, 10 refs. (Rept. no. 6-90-61-116)

Unclassified report

DESCRIPTORS: (*Intermediate frequency amplifiers, *Electronic circuits, *Thin films, Electrodes, *Electrostatic capacitance, Dielectrics.) (Thin films, Thickness, Resistance, Electrostatic capacitance, Temperature, Dielectric properties.)

The interelectrode capacitance in film-type circuits becomes a critical design limitation as dimensions decrease and as substrates of high dielectric constants are developed. Design charts are presented and illustrated by evaluating the effect of stray capacitance on a completed film-type IF amplifier circuit. (Author)

AD-271 050 Div. 8, 25
(TISTE/CRJ) OTS price $3.60

Texas Instruments, Inc., Dallas.
SEMICONDUCTOR RESISTIVE ELEMENT.
Final rept., 1 July-31 Dec 61.
30 Jan 62, 34p. incl. illus. table.
(Contract NObsr-85406)

Unclassified report

DESCRIPTORS: (*Resistors, *Semiconductors, Materials, Silicon, Titanium compounds, Dioxides, Silcon compounds, Gallium compounds, Arsenides, Lead compounds, Tellurides, Indium compounds, Antimonides, Selenium compounds, Crystals, Single crystals, Carbides, Borides, Chemical impurities.)

Efforts were made to develop a low temperature coefficient of resistance (TCR) semiconductor resistive element with more stable characteristics and greater reliability than the metal film resistors presently on the market. Several semiconductor materials (reduced ttania, silicon carbide, silicon boride, gallium arsenide, etc.) were considered as bulk elements and for various reasons were rejected. The elements thought most promising were silicon layer configurations formed either by diffusion or by vapor deposition. Silicon layer elements in the preliminary stages of development exhibited TCR's as low as 350 ppm at resistivities of approximately 0.0X ohm-cm. Load life and TCR data are presented for both the standard network devices and the experimental silicon diffused, epitaxial and polycrystalline elements. (Author)

AD-271 054 Div. 8
(TISTE/NTM) OTS price $2.60

Watkins-Johnson Co., Palo Alto, Calif.
DEVELOPMENT OF A MILLIMETER LOW-NOISE TRAVELING-WAVE AMPLIFIER.
Quarterly rept. no. 4, 1 Sep-1 Dec 61,
by E. W. Kinaman. 1 Dec 61, 17p. incl. illus.
(Contract DA 36-039-sc-87384, Proj. 3G19-03-001-04)

Unclassified report

DESCRIPTORS: (*Traveling wave tubes, *Microwave amplifiers, Extremely high frequency, Broadband, Noise (Radio), Reduction, Design.) (Electron tubes, Cathodes (Electron tubes), Helixes, Waveguide windows, Mica, Standing wave ratios, Magnets, Electron beams, Focusing, Electron guns.) (Antennas, Processing, Tests.)

Research was continued on the development of a millimeter low-noise traveling wave amplifier. The first tube was fabricated and is presently in test. The tube's vacuum is excellent, interelectrode leakages are small, cathode emission exists, and at low beam currents, well over 90% of the beam current has reached the collector. The section of the wedge entering the output waveguide was redesigned to be heavier and stronger and the exterior of the output waveguide was reworked to allow rigid mounting on a tongue-and-groove slide in the helix-wedge support block. The window sealing problem was solved by restricting the lift-up with a cover frame. The complete assembly is of the sandwich variety, with mica glazed between. Improvement in heater coatings provided a 50% chance of reaching proper temperature in the first 2 tubes. (Author)

AD-271 064 Div. 8, 6
(TISTE/CRJ) OTS price $5.60

Bomac Labs., Inc., Beverly, Mass.
DEVELOPMENT OF BANDPASS MILLIMETER DUPLEXER.
Final rept., 15 Feb 59-20 Nov 61,
by Arthur G. Barrett. 20 Nov 61, 50p. incl. illus. tables (Rept. no. 25)
(Contract DA 36-039-sc-78285, Proj. 3-20-00-405)
Unclassified report

DESCRIPTORS: (*Radar duplexers, *Switching circuits, *Transmit-receive tubes, *Electronic switches, Single crystals, Broadband, K band, Design.)

The successful development of the duplexer type BL-P-017D demonstrates the feasibility of scaling a conventional balanced duplexer design to operate at 4.3 millimeters. The basic circuitry remains unchanged, while structures and assembly techniques are adapted to the reduced wavelength. The BL-P-017D balanced duplexer exceeds the performance of the BL-24 branched duplexer in terms of lower losses and lower spike and flat leakage. Mechanically the BL-P-017D duplexer is more rugged and compact because the glass reservoir and tuning mechanism are eliminated from the package. Both the 3-element and 4-element crystal protectors are marginal in high level performance, but satisfy the low level design requirements. (Author)

AD-271 074 Div. 8
(TISTE/NTM) OTS price $1.60

Anti-Submarine Warfare Lab., Naval Air Development Center, Johnsville, Pa.
THE TUNNEL DIODE AS A PREAMPLIFIER FOR VHF AM-FM RADIO RECEIVER IN SONOBUOYS.
Phase rept.,
by F. W. Smith. 26 Jan 62, 14p. incl. illus. 10 refs. (Rept. no. NADC-AW-6110)
(NEPTASK NO. RUDC2B541/2021/F001-13-003)
Unclassified report

DESCRIPTORS: (*Diodes, *Transistors, Preamplifiers, *Radio receivers, *Transistor amplifiers, Semiconductors, Amplitude modulation, Frequency modulation, Airborne, Very high frequency, *Radio sono buoys, Theory, Design.) (Circuits, Electronic circuits, Amplifiers.)

A study was made to determine the feasibility of using a tunnel diode as a preamplifier for a sonobuoy VHF AM-FM receiver. The results showed that the tunnel diode can be used as a stable amplifier in the sonobuoy frequency range if care is taken in the choice and placement of components and their wiring in the circuit. (Author)

AD-271 101 Div. 8, 25
(TISTA/GEC) OTS price $2.60

General Telephone and Electronics Labs., Inc., Bayside, N. Y.
STUDIES OF ELECTRON TUBE MATERIALS AND THERMIONIC EMISSION PROCESSES.
Scientific rept. no. 7, 1 Oct-31 Dec 61,
29 Dec 61, 23p. incl. illus. tables (Rept. no. TR61-704-104-204-208.15)
(Contract AF 19(604)7286)
(AFCRL 62-2)
Unclassified report

DESCRIPTORS: (Cathodes (Electron tubes), *Oxide cathodes, Diodes, Nickel, Materials, *Thermionic emission.) (Oxide cathodes, Sublimation, Measurement.) (Evaporation, Thin films, Barium, Barium compounds, Oxides, Platinum, Nickel, Tantalum.) (Tungsten, Aluminum compounds, Oxides, Chemical reactions, Temperature.) Magnetism, Polarization, Mass spectroscopy.

The thermionic emission properties of ultra-pure Ni based oxide cathodes in the clean test diode were investigated. The effects of the following processing, activation and life conditions on thermionic emission were evaluated: (1) improvement in the cleanliness of the diode system by pre-processing the bulb, stem and supporting elements prior to final assembly of the test diode; (2) dependence of the electrolytic activation process on cathode temperature, anode voltage and anode current; (3) operation of the test diodes during life both with and without anode voltage. The method which was developed for measuring the evaporation of active material from dispenser cathodes was extended to the more difficult problem of measuring sublimation of active material from oxide cathodes. Preliminary results on the evaporation of Ba and/or BaO were obtained for the following passive and active metal base oxide systems; BaO on Pt; BaO on ultra-pure Ni rod; BaO on active N4 Ni; BaO on Ta; C-10 triple oxide coating on ultra-pure Ni; C-10 on N4 Ni. (Author)

AD-271 107 Div. 8, 15
(TISTP/WH) OTS price $3.60

Johns Hopkins U. School of Engineering, Baltimore, Md.
REPRESENTATION AND ANALYSIS OF SIGNALS. PART IX. 'COMPLEMENTARY' SIGNALS AND ORTHOGONALIZED EXPONENTIALS,
by T. Y. Young and W. H. Huggins. 1 Jan 62, 32p. incl. illus. 11 refs.
(Contract Nonr-24853)
Unclassified report

DESCRIPTORS: (*Information theory, *Radio-frequency filters, Radio signals, Circuits, Electrical networks.) (Vector analysis, Applied mathematics, Series, Transformation (Mathematics).)

When a signal is approximated by a finite set of component signals which span a subspace, the least square approximation may be interpreted geometrically in signal space as the projection of the true signal vector upon this finite dimensional subspace. In case the component signals are one-sided exponentials, the projection operators may be realized by simple physical filters following Kautz' procedure for constructing orthogonalized exponentials. This analysis concerns the 'present-instant' error, the 'complementary' signal and the 'complementary' filter which are useful concepts in approximating a signal by one-sided exponential components. In particular, it is found that the 'complementary' filter for a given finite exponential basis is an all-pass rational transmittance having zeros in the frequency domain which match the exponents of the basis. This familiar all-pass filter indeed represents an orthogonal transformation which preserves the energy of the signal under transformation. A signal to be approximated is transformed by this filter into the 'complementary' signal which can be separated in time domain into two parts, namely a 'complementary' approximating signal and a 'complementary' error signal. (Author)

Division 8 - ELECTRONICS AND ELECTRONIC EQUIPMENT

AD-271 117 Div. 8, 22
(TISTE/NTM) OTS price $1.10

Naval Ordnance Test Station, China Lake, Calif.
RF FILTERS AS RADIATION-HAZARD SUPPRESSORS,
by Russell N. Skeeters. Dec 61, 8p. incl. illus.
(NOTS TP 2802)
(NAVWEPS rept. no. 7805)
Unclassified report

DESCRIPTORS: (*Radiofrequency filters, *Low-pass filters, Suppressors, *Radiation hazards, Design.) (Explosions, Explosive actuators, *Ordnance, *Safety, Electric igniters, Firing circuits, Electromagnetic fields, Electrical networks, Radio interference, Reduction.)

One of the techniques used in protecting ordnance from accidental initiation by radio frequency currents is to place a low-pass filter in front of the electroexplosive device. The task of designing filters for this purpose, using the procedures based upon transmission line theory, is tedious and difficult to realize. An analysis is presented of some elementary low-pass filters which points out implications of their loss-characteristic equations for the design of radiation-hazard-suppressing filters. (Author)

AD-271 177 Div. 8
(TISTE/CRJ) OTS price $16.50

General Electric Co., Syracuse, N. Y.
DEPRESSED COLLECTOR STUDIES FOR HIGH POWER KLYSTRONS.
Final technical rept.
30 Mar 61, 242p. incl. illus. tables, refs.
(Contract AF 30(602)1500)
(RADC TR 61-204) Unclassified report

DESCRIPTORS: (*Klystrons, Microwave equipment, X band, *Electron beams, Space charges, Secondary emission, Electrons, Electrodes.) Electron tubes.

A technical discussion is presented summarizing the present state of the art of depressed collectors for high power tubes, and pointing out considerations to be made in an actual design. Theoretical investigations based on a highly simplified klystron beam model were carried out, and the results render interesting information on the power balance in the spent beam, the amounts of power that can be recovered by a depressed collector with a finite number of electrodes, the resulting improvement of tube efficiency, the influence of secondary electrons, the reduction of X-radiation generated within the collector and the discrimination effect of outside shielding, the effects of the collector-to-ground capacitance on resistive collector depression, and finally the effects on the inherent velocity-sorting mechanism of the spent beam under large signal drive conditions of the tube. The experimental investigations were carried out on a one-megawatt pulsed X-band klystron at beam voltages around 100 kv. (Author)

AD-271 179 Div. 8
(TISTE/CRJ) OTS price $9.10

Electrical Engineering Research Lab., U. of Illinois, Urbana.
APPLICATION OF TUNNEL DIODES IN LINEAR NETWORK SYNTHESIS,
by Belle Anantha Shenoi. 1 Dec 61, 97p. illus. 26 refs. (Technical note no. 17)
(Contract AF 49(638)63, Proj. 475-1)
(AFOSR-1898) Unclassified report

DESCRIPTORS: (*Electrical networks, *Diodes, Linear systems, Impedance, Synthesis, Functions, Theory.)

An investigation is presented of the application of tunnel diodes in grounded lossy networks without any transformers for realizing transfer functions with as few restrictions as necessary. After choosing a lumped, linear, small-signal equivalent circuit for the model of the device as a capacitance in parallel with a negative conductance, some properties of networks in which the tunnel diode is embedded are obtained. A systematic study of transfer function synthesis is developed. One of the synthesis techniques gives rise to a cascade connection of an RC and an RL network embedded with at most 2 tunnel diodes. Hence the capacitors and inductors can be provided with different amounts of dissipation. An integral part of this transducer network can be used as the dc bias circuit for the tunnel diodes, thereby assuring no change in the transfer characteristic of the network when the diodes are energized by a single dc supply. DC stability of the diodes is also guaranteed when the network is ac stable. The decomposition of a polynomial such that its zeros can be realized as the natural frequencies of a cascade connection of an RC and an RL network with a tunnel diode in shunt between them is considered. (Author)

AD-271 354 Div. 8
(TISTE/MS) OTS price $9.10

Radiation, Inc., Melbourne, Fla.
AN ELECTRONIC SWITCHBOARD EMPLOYING NEGATIVE IMPEDANCE DEVICES.
Quarterly progress rept. no. 2, 1 Sep-30 Nov 61,
by B. Grace, W. Eddy and R. Zmich. 30 Nov 61, 94p. incl. illus. tables, 8 refs.
(Contract DA 36-039-sc-87245)
Unclassified report

DESCRIPTORS: (*Panel board (Electricity), Electronic equipment, *Switching circuits, Negative resistance circuits, Electronic circuits, Impedance, Automatic, Diodes, *Electronic switches, Solid state physics, Interference, Design, Multichannel telephone systems.)

Several different types of matrix configurations were studied. Calculations were made to determine the probability of blocking, number of crosspoints and grade of service for each of the types considered. The results of these calculations are shown and 2 basic matrix configurations are examined in detail. The 4 layer PNPN switching device was completely explored and the results are illustrated, indicating the feasibility of the device selected to perform the switching functions required in the matrix. Tentative circuit configurations for the matrix are shown along with a circuit diagram of a send and receive path employing the PNPN device. (Author)

AD-271 367 Div. 8, 15
(TISTP/JW) OTS price $11.50

Sylvania Electric Products, Inc., Waltham, Mass.
MATHEMATICAL SIMULATION FOR RELIABILITY PREDICTION.
30 Oct 61, 156p. incl. illus. tables, refs.
(Rept. no. F491-1)
(Contract AF 30(602)2376)
(RADC TR 61-299) Unclassified report

DESCRIPTORS: (*Reliability, Determination, *Electronic systems, Electronic equipment.)

(Statistical analysis, Numerical methods and procedures, *Mathematical prediction, Failure (Mechanics), Time, Measurement.)

The results of a study for the development of techniques for predicting the reliability of electronic systems from statistical information about the performance of system components are presented. The problem of determining initial system performance and system performance over time, given changes in component characteristics in time, is analyzed. The prediction of the reliability of systems whose performance is measured on a continuous scale and which are subjected to degradation type failures is emphasized. Catastrophic failure models including repair and redundant elements are also discussed. It is concluded that, with the exception of certain simple systems, mathematical simulation provides the only feasible means for generating the probability distribution of various appropriate measures of system reliability when component and system performance measures have a continuous range. The mathematical simulation technique is applied to several demonstration problems and information on the sample sizes required to estimate the distributions of reliability measures are given. (Author)

AD-271 378 Div. 8, 12
(TISTE/NTM) OTS price $6.60

Applied Physics Lab., Johns Hopkins U.,
Silver Spring, Md.
ANTENNA SYSTEMS FOR SATELLITES,
by B. Strom. May 61, 61p. incl. illus. 3 refs.
(Rept. no. CM-998)
(Contract NOrd-7386)
Unclassified report

DESCRIPTORS: (*Satellite vehicle antennas, *Dipole antennas, Theory.) (*Antennas, Electric fields, *Antenna radiation patterns, Mathematical analysis.)

An approximate theory is developed for the calculation of the radiated field from antenna systems consisting of short elements protruding from the metallic shell of a satellite. This theory is applied to various configurations to find the one giving the most uniform field. (Author)

AD-271 399 Div. 8
(TISTE/NTM) OTS price $5.60

Litton Industries, San Carlos, Calif.
INJECTED-BEAM, CROSSED-FIELD, FORWARD-WAVE AMPLIFIER AT X-BAND.
Quarterly rept. no. 2, 1 Sep-31 Dec 61,
by Robert Cougoule and Gerold P. Kooyers.
26 Jan 62, 34p. illus. 9 refs.
(Contract NObsr-85318)
Unclassified report

DESCRIPTORS: (*Microwave amplifiers, X-band, *Electron beams, *Electron tubes, *Electron guns, Design, Radiofrequency power, Computers, Manufacturing methods, Production.) (Waveguide couplers, Standing wave ratios, Impedance matching.)

Research was continued on the design, development and fabrication of six high-power, crossed-field amplifiers. Substantial progress toward fabrication and test of Tube No. 1 was made. Construction of parts for subsequent tubes is nearing completion. Additional tests on the gun have yielded a non-critical design wherein the grid-to-cathode voltage was substantially reduced over previous designs. Construction of this gun is completed except for final assembly within the tube. The computer study has yielded the RF circuit power for the complete two-section tube. At the band edges, these results are as expected. At Mid-band, certain anomalies in power build-up were observed. Sufficient cold isolation across the sever was obtained with a simple sole-segment geometry. It is shown that lossy material in the sole region has little effect on the sole stop-band structure, and will not be used within the tube. (Author)

AD-271 400 Div. 8, 6
(TISTW/DLW) OTS price $4.60

Lincoln Lab., Mass. Inst. of Tech., Lexington.
A MECHANICAL DUPLEXER FOR HIGH-POWERED X-BAND RADARS,
by Bernard F. LaPage. 8 Dec 61, 10p. illus. tables (Rept. no. 315 G-3)
(Contract AF 19(604)7400)
Unclassified report

DESCRIPTORS: (*Radar duplexers, X band, Radiofrequency power, Microwave equipment, Masers, Broadband, Switches, Design, Signal-to-noise ratio, Noise (Radar), Standing wave ratios, Effectiveness, Tests.)

The combination of high power and the use of a low-noise maser receiving system places severe requirements on modern radar duplexing systems. Typical values of isolation of -120 db and insertion loss of less than -0.2 db are required to prevent deterioration of the maser gain and low-noise capabilities. The only presently available system that can approach the needed performance is the mechanical duplexer. A duplexer unit is discussed which was developed for the West Ford radar system. (Author)

AD-271 404 Div. 8
(TISTE/NTM) OTS price $2.60

Microwave Associates, Inc., Burlington, Mass.
PHASE SHIFTER STUDY PROGRAM (NON-FERRITE).
Quarterly progress rept. no. 6, 1 Oct-31 Dec 61,
by Charles Howell and Joseph White. Jan 62, 18p. illus.
(Contract NObsr-81470)
Unclassified report

DESCRIPTORS: (*Phase shifters, *Semiconductors, Microwave equipment, L band, Electronic circuits, Electronic scanners, Diodes, Waveguide couplers, Coaxial cables, S band, Design.)

Two general phase-shifting techniques were investigated, both of which employ semiconductor elements. The first approach is the step or incremental phase-shifting device which provides for discrete changes in phase. The second phase-shifting approach is a continuously variable one which provides for a greater flexibility in phase control. Both the semiconductor material and the circuit problems involved in each of the 2 approaches were further explored in some detail. The present study results indicate that both the desired phase-shifting characteristics as well as power-handling capabilities can be reached. Phase shifters were built for L-band which, for the incremental type, can handle peak powers in excess of 75 kw, and for the continuous type can handle 2 - 6 kw peak power. (Author)

Division 8 - ELECTRONICS AND ELECTRONIC EQUIPMENT

AD-271 410 Div. 8
(TISTE/GEC) OTS price $3.60

Defense Research Lab., U. of Texas, Austin.
(No title).
Progress rept. no. 1, 1 Oct-31 Dec 61.
26 Jan 62, 11p. illus.
(Contract NObs-86165; Continuation of Contract NObs-77033)
Unclassified report

DESCRIPTORS: (*Acoustic filters, *Acoustic impedance, Fluids.) (Measurement, Wave transmission, Water, Pipes, Brass, Copper alloys, Nickel alloys.) Pipe fittings, Vibration isolators, Springs.

Some calculated values of ideal filter characteristics are presented. These calculations were made in the course of preparation of a design manual for acoustic filters. Several topics relating to measurement of acoustic impedance in fluid systems are discussed. Experimentally determined values of plane wave velocity and characteristic impedance for water in thick-walled brass pipe are given and compared with values found previously for water in thin-walled Cu-Ni pipe. In both cases, values of wave velocity and characteristic impedance were obtained from impedance measurements on short water columns of several different lengths. Recent modifications of the impedance head built at DRL are described. The instrument was recalibrated after modification, and results of this procedure are given. Curves showing measured values of acoustic impedance of 2 metal bellows type side branch resonators are given. Work on pipe couplings and hangers for isolating vibration is described. Construction details of a pipe hanger using zero stiffness springs and a pressure-compensated, flexible pipe coupling are shown. (Author)

AD-271 413 Div. 8, 25
(TISTW/DLW) OTS price $2.60

Whirlpool Corp., St. Joseph, Mich.
THERMOELECTRIC TEMPERATURE CONTROL IN AN/URQ-9 FREQUENCY STANDARD.
Interim development rept. no. 3, 1 Oct-31 Dec 61,
by R. G. Sickert, and A. F. Martz. 22 Jan 62,
24p. incl. illus. 1 ref.
(Contract NObsr-85314)
Unclassified report

DESCRIPTORS: (*Crystal ovens, Radiofrequency, Frequency, Standards, Frequency stabilizers, *Thermoelectricity, *Temperature control, Heat exchangers, Crystals, Design, Installation, Tests.)

Modifications are discussed which were made in the AN/URQ-9 oven assembly. The highlights of oven construction, thermoelectric device construction, component placement, and the results of preliminary performance test are given. The entire oven assembly was completed and installed in the AN/URQ-9 frequency standard. (Author)

AD-271 423 Div. 8, 25
(TISTP/TL) OTS price $4.60

Giannini Scientific Corp., Santa Ana, Calif.
IONIZATION IN AN ELECTRODELESS DISCHARGE.
PART II.
by R. P. Treat. Sep 61, 29p. illus.
(Contract AF 49(638)1014, Proj. 9751)
(AFOSR-1522) Unclassified report

DESCRIPTORS: (*Gases, *Electric discharges, Gas discharges, *Gas ionization, Thermonuclear reactions, Magnetic fields, *Plasma physics, Hydrogen, Argon.) (Discharge tubes, Instrumentation.) (Electrons, Diffusion.)

The breakdown of a gas in an electrodeless discharge is studied. The configuration consists of a long cylindrical gas column subjected to a strong, fast rising axial magnetic field. The investigation showed that when losses are by free electron diffusion and electric fields due to charge separation are negligible, appreciable multiplication of electrons takes place in an interval of time 2tc (the cut-off time for ionization) when the magnetic field is nearly zero. The voltage around the discharge tube that produces a given multiplication of electrons in the time interval 2tc (the cut-off time for ionization) is determined. This voltage is compared with experimentally observed breakdown voltages in argon and hydrogen. (Author)

AD-271 424 Div. 8, 25
(TISTP/TL) OTS price $1.10

Giannini Scientific Corp., Santa Ana, Calif.
INITIAL BREAKDOWN OF GASES IN ELECTRODELESS DISCHARGES.
Final rept.,
by H. G. Loos. Sep 61, 7p.
(Contract AF 49(638)1014, Proj. 9751)
(AFOSR-1521) Unclassified report

DESCRIPTORS: (*Gases, *Electric discharges, Gas discharges, *Gas ionization, Thermonuclear reactions, Magnetic fields, *Plasma physics, Hydrogen, Argon.) (Instrumentation, Oscilloscopes, Photomultipliers, Photography.)

AD-271 428 Div. 8, 17
(TISTM/GEC) OTS price $1.60

Aeronautical Electronic and Electrical Lab.,
Naval Air Development Center, Johnsville, Pa.
EVALUATION OF COMMERCIAL TYPES OF TEST POINTS FOR AVIONIC EQUIPMENT.
Final rept.,
by P. A. Mingle. 18 Jan 62, 5p. incl. tables.
(Rept. no. NADC-EL-61120)
(WEPTASK no. RAV41J001/2021/R008-01-001)
Unclassified report

DESCRIPTORS: (*Electric connectors, Beryllium alloys, Copper alloys, Silver alloys, Gold plating, Tin coatings, Electronic equipment for Aircraft.) Tests, Dielectric properties, Resistance, Humidity, Vibration.

Three commercially-available test points were selected for evaluation. The test points evaluated were all of the pressfit type. It was found that the mounting holes must be drilled or punched exactly to the size and tolerance recommended by the manufacturer or the test point would not hold in its mounting plate. Also, the tools necessary for mounting the test points were not standardized and each manufacturer's product required its own specially dimensioned tool to properly mount the test point. The test points were evaluated in accordance with the procedures of MIL-STD-202B, for the following tests: dielectric strength; insulation resistance; contact resistance; humidity; and vibration. (Author)

AD-271 455 Div. 8, 26
(TISTE/NTM) OTS price $1.60

Lansdale Div., Philco Corp., Pa.
PEM FOR ELECTROCHEMICALLY ETCHED TRANSISTORS 2N495 AND 2N496.
Quarterly progress rept. no. 2, 19 Aug-19 Nov 61, by D. Weisel and J. Biscoe. 19 Nov 61, 17p. incl. illus. (Rept. no. R-230.1)
(Contract DA 36-039-sc-85959)
Unclassified report

DESCRIPTORS: (*Transistors, Manufacturing methods, Production, Design.) (Silicon, *Single crystals, Servo systems, Electrodes, Electroplating, Soldering, Attachment.)

Research continued on the design and development of electrochemically etched transistors. The mechanical design of the machine is 50% complete through the assembly layouts. Several subassemblies are ready for manufacture. Investigations are continuing toward the evolvement of the optimum soldering conditions for machine operation. The electrical design of the blank and whisker positioning systems is proceeding on schedule. (Author)

AD-271 482 Div. 8
(TISTE/NTM) OTS price $5.60

Microwave Lab., General Electric Co., Palo Alto, Calif.
DEVELOPMENT Z-5161 100 WATT CW X-BAND TWT.
Final rept.,
by John L. Putz, Gerard C. Van Hoven, and Lawrence E. Didier. Dec 61, 44p. incl. illus. tables, 3 refs.
(Contract AF 33(600)32011, Proj. 4156)
(WADD TR 60-644)
Unclassified report

DESCRIPTORS: (*Traveling wave tubes, X band, *Microwave amplifiers, Broadband.) (Amplifiers, Electron tubes, Electron guns, Helixes, Electronic circuits, Focusing, Materials, Metals, Ceramic materials.)

Research was completed on the development of a broadband traveling-wave amplifier capable of operating over the frequency range 7500 to 11300 mc with a power output of 100 watts cw, and 20 db minimum gain. This tube, the Z-5161, is of metal-ceramic construction, and is focused by a permanent magnet. The Z-5161 uses a novel multiple-helix structure as the slow-wave circuit. This circuit has not only solved the problem of power handling capability, which limited power output of previous tubes, but also resulted in a shorter, more rugged tube. The properties of this circuit are described in detail, and curves useful for design are presented. The design and construction of the Z-5161 are described, including electrical parameters, gun design, slow-wave circuit fabrication, collector design, and the construction of broadband RF matches and vacuum windows. The permanent magnet used for focusing is also described. Test results for several tubes are discussed. These results show that a broadband 100 watt cw X-band traveling-wave amplifier is practical, and that some further increase in power level may be possible. (Author)

AD-271 511 Div. 8, 6
(TISTE/NTM) OTS price $4.60

Naval Supersonic Lab., Mass. Inst. of Tech., Cambridge.
THEORETICAL OPTIMUM DESIGN OF A LOW FREQUENCY, SMALL SIZE, BAND-PASS ELECTRONIC FILTER.
by Paul G. Savage. June 61, 33p. incl. illus. 5 refs. (Technical rept. no. 499)
(Contracts Nonr-184140 and AF 33(616)6046)
Unclassified report

DESCRIPTORS: (*Band-pass filters, *Acoustic filters, Narrowband, Miniature electronic equipment, Design.) (*Audio amplifiers, *Infrared detectors, Signal-to-noise ratio, Noise (Radio). Reduction, Effectiveness, Theory, Mathematical analysis.)

An optimum small size, low frequency, narrow band-pass filter amplifier is theoretically designed for the purpose of improving the signal-to-noise ratio of infrared radiation detectors. Optimum design is based on maximum sharpness for minimum physical size. The filter is designed to be comparable to a miniature correlator, previously developed for the same purpose and described in another report, both in physical size and in noise elimination effectiveness. Optimum design curves of filter component values as a function of a normalized design time constant have been prepared. The theoretical effectiveness of the filter in eliminating noise is presented graphically and compared to similar correlator performance data. (Author)

AD-271 530 Div. 8, 25
(TISTP/TL) OTS price $9.60

Cornell U., Ithaca, N. Y.
AMPLITUDE FLUCTUATIONS IN THE FRESNEL REGION OF A PHASE-CHANGING DIFFRACTING SCREEN,
Scientific rept. no. 4 on Refraction,
by L. S. Wagner. 25 Aug 61, 110p. incl. illus. tables, 32 refs. (Research rept. no. RS 27)
(Subcontract to Cornell Aeronautical Lab., Contract AF 30(602)2077)
Unclassified report

DESCRIPTORS: (*Radio waves, *Spectrographic analysis, Polarization, Scattering, Radio interference, Angle of arrival, *Diffraction, Reflection, Phase modulation, *Radio astronomy, Electric fields, Electrons, Density, Ionosphere, *Extraterrestial radio waves.) (Statistical processes, Integral transforms, Taylor's series, Statistical functions, Statistical distributions, Geometry, Probability.)

The angular spectrum of radio waves that results from the diffraction of a linearly polarized, monochromatic plane wave by a one-dimensional random phase-changing screen consists of a residual plane wave plus a continuous angular spectral density of scattered plane wave. When the mean square phase deviation, $\overline{\phi^2}$, is less than one radian; simple geometry leads to an expression for the fluctuation of the signal amplitude ΔA, in terms of components of the signal phasor. These, in turn, are expressible in terms of the angular spectrum of the diffracted wave. Starting with the relationship between ΔA and the scattered angular spectrum, one can use statistical methods to determine $\overline{\Delta A}$ and the amplitude fluctuation index, F_{rms}, defined by $\overline{(\Delta A)^2}/\overline{A}^2$.

These quantities are given in terms of integrals of the angular power spectrum of the scattered radiation. (Author)

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AD-271 535 Div. 8
(TISTE/NTM) OTS price $2.60

Bomac Labs., Inc., Beverly, Mass.
BL-221 70 Gc MAGNETRON PRODUCTION ENGINEERING MEASURE.
Quarterly progress rept. no. 1, 6 Aug-6 Nov 61, by Gary G. Riska. 6 Nov 61, 22p. incl. illus. tables.
(Contract DA 36-039-sc-85974)
Unclassified report

DESCRIPTORS: (*Magnetrons, Production, *Manufacturing methods, Test sets, Design.) (Electron tubes, Anodes (Electron tubes), Cathodes (Electron tubes), Magnetic fields.) (Waveguide windows, Standing wave ratios, Ceramic materials, Metals, Glass, Sapphires, Design.)

Efforts concern the investigation of minor constructional modifications in the present BL-221 Magnetron design and the setting up of facilities capable of producing at a rate of 50 tubes per month. Sample tubes with Vac-Ion pumps were constructed. Work on standard design tubes for comparative study was initiated and the initial test results were compiled. Design work on the ceramic output window was initiated and experimental samples to develop effective techniques for making ceramic-to-metal seals, were built. Construction work on the life test kit was completed. (Author)

AD-271 567 Div. 8, 14, 26
(TISTM/EJH) OTS price $8.60

Plastics Research Lab., Mass. Inst. of Tech., Cambridge.
A STUDY OF RIGID POLYURETHANE FOAM AS A STRUCTURAL MATERIAL FOR RADOMES FOR LINCOLN LABORATORY,
by Richard E. Chambers. 9 Nov 61, 99p. incl. illus. tables.
Unclassified report

DESCRIPTORS: (*Radomes, Materials, Brittle materials, *Expanded plastics, Polymers, *Urethanes.) (Density, Tensile properties, Mechanical properties, Production, Quality control, Failure (Mechanics), Fracture (Mechanics), Welded joints, Bonded joints, Design, Reliability.) (Tests, Test methods.)

A study of rigid urethane foam was performed to determine its suitability as a structural material for radomes. The material was not homogeneous in density and in mechanical properties. Panels manufactured from the same material, and by the same process, were not alike. The material was ductile to a stress concentration of 2.5; at higher levels of stress concentration, the material may exibit brittle behavior. Tests on large samples emphasized the erratic nature of the material. Sound weldments were obtained and the factors important to weldment integrity were established. A design of an efficient base connection was developed. Refinements in this design should lead to an optimum solution in function and in cost. Finally, the shrinkage behavior of weldments was explored; a promising candidate material was found. (Author)

AD-271 588 Div. 8, 1, 17
(TISTE/GEC) OTS price $2.60

Narmco Industries, Inc., San Diego, Calif.
ALUMINA RADOME ATTACHMENT.
Quarterly rept. no. 3,
by Robert A. Caughey, Francis M. Wilson, and Roger A. Long. Jan 62, 19p. incl. illus. tables.
(Contract AF 33(616)8157)
Unclassified report

DESCRIPTORS: (*Radomes, Airborne, *Ceramic materials, *Aluminum compounds, *Oxides, Bonding, *Brazing, *Adhesives, High temperature research.) (Refractory materials, Molybdenum alloys, Diffusion, Nickel, Platinum alloys, Palladium alloys, Gold alloys, Iridium alloys, Ruthenium alloys.) (Coatings, Molybdenum, Flame spraying, Plasma jets.) (Metal joints, Microstructure.) Epoxy resins.

Chemical attachment methods of bonding alumina ceramic to Mo TZM alloy were investigated prior to actual test specimen fabrication and evaluation. The investigation of precious metal braze alloys indicated that they would withstand temperatures to at least 2300 F for periods of 15 min without softening. Diffusion and alloying embrittlement of the Mo alloy by the braze alloys was definite, even at minimum brazing times; however, due to the eventual thickness of the Mo alloy, necessary for design strength, complete metal thickness embrittlement was not anticipated. Mo plasma sprayed coated alumina was evenly applied and resisted thermal cycling to the braze process temperature. A new method of bonding Mo to Mo by use of diffused Ni was investigated and initial tests indicated promise. (Author)

AD-271 615 Div. 8
(TISTP/WH) OTS price $4.60

Goettingen U. (Germany).
ABSORPTION AND TRANSMISSION OF ELECTROMAGNETIC WAVES. PHASE H. DIPOLE-RESONANCE-ABSORBER FOR WIDE ANGLES OF INCIDENCE,
Final technical rept.,
by E. G. Neumann. 30 Sep 61, 47p. incl. illus.
(Contract AF 61(052)154)
(RADC TDR 62-22) Unclassified report

DESCRIPTORS: (Electromagnetic waves, *Electromagnetic wave reflections, *Microwaves, Reflection, Extremely high frequency, Absorption, Materials.) (Microwaves, *Resonance absorption, Dipole antennas.) Propagation.

Reduction of the reflection coefficient of dipole absorbers for oblique incidence of electromagnetic waves was investigated. To complete the theory of reflection by the additional system of dipoles, the propagation of electromagnetic waves in an artificial absorbing medium consisting of infinitely long parallel wires with small conductivity was studied. Measurements were made with centimeter waves using a parallel-plate-transmission line to determine the equivalent propagation constants of the medium by scanning the electric field with respect to amplitude and phase. The propagation properties of the parallel wire medium are explained with a theory deduced from an analogy to line-theory. (Author)

AD-271 619 Div. 8
(TISTP/FR) OTS price $3.60

Radio Corp. of America, Lancaster, Pa.
DESIGN, DEVELOP, AND EVALUATE A HIGH-POWER INTEGRAL CIRCUITED TETRODE FOR 215 MEGACYCLE OPERATION.
Quarterly interim technical rept. no. 3, 1 Oct-31 Dec 61,

by T. E. Yingst, I. E. Martin, and F. F. Marinaro. 31 Jan 62, 36p. incl. illus. 3 refs. (Contract NObsr-85371)

Unclassified report

DESCRIPTORS: (*Tetrodes, *Power amplifiers, Radiofrequency power, Very high frequency.) (Circuits, Design, Very high frequency.) *Impedance matching.

The design, development and evaluation of a high-power integral-circuited tetrode for 215 megacycle operation is treated. The achievement of 825 kilowatt minimum peak power output over a ten percent frequency band is the primary objective. The work in the analysis of broadband matching techniques for the input circuit, construction of the output cold-probe assembly, impedance measurements of the output rf bypass, optimization of the output response curve and modification of test equipment is detailed. (Author)

AD-271 627 Div. 8
(TISTE/MS) OTS price $2.60

David Sarnoff Research Center, Princeton, N. J.
OSCILLISTOR DEVICE RESEARCH.
Quarterly rept. no. 3, 1 Sep-30 Nov 61,
by R. D. Larrabee. 31 Dec 61, 21p. incl. illus. table, 14 refs.
(Contract DA 36-039-sc-87415, Proj. 3A-99-21-001)

Unclassified report

DESCRIPTORS: (*Crystal oscillators, Electric fields, Magnetic fields, Tests, Design.) (Oscillation, Theory, Mathematical analysis.) (*Oscillators, Crystals, Germanium, Semiconductors, Surface properties.)

Experiments to measure conditions under which one just observes the onset of Oscillistor action are in progress. The qualitive dependence upon the applied electric and magnetic fields, specimen size, and bulk electrical properties is now known. The surface properties remain to be investigated. Design criteria for making Oscillistors which will require a minimum of electrical input power were found. Experiments with such low power Oscillistors suggest that it is possible to operate an Oscillistor continuously at room temperature if a suitable nonreactive solid ambient is provided for not only carrying away the heat dissipated by the Oscillistor, but also for protecting and stabilizing the semiconductor surface from external influences. Experiments are also in progress to detect the magnetic field produced by the proposed helical currents of M. Glicksman's Oscillistor theory. If successful, it is anticipated that the converse interaction would be operative and that one could construct an Oscillistor amplifier in this way. (Author)

AD-271 630 Div. 8, 25
(TISTP/WH) OTS price $9.60

Sperry Microwave Electronics Co., Clearwater, Fla.
SOLID STATE HARMONIC LIMITERS.
Final rept.,
by G. R. Harrison, J. Brown, and L. Whicker. July 61, 1v. incl. illus. refs. (Rept. no. SJ220-028A-4)
(Contract AF 30(602)2296, Proj. 4506)
(RADC TR 61-321)

Unclassified report

DESCRIPTORS: (Ferromagnetism, Ferromagnetic materials, Nonlinear systems, *Harmonic oscillators, *Radiofrequency filters.) (Ferrites, Garnet, Band-pass filters, Electronics, *Solid state physics.)

The nonlinear characteristics and applications of ferromagnetic and ferrimagnetic materials to microwave spurious harmonic limiters were studied. The high power characteristics of ferrimagnetic materials for application to very high-power harmonic suppressors were investigated. Additional theoretical and experimental investigations were performed on the utilization of conventional waveguide filters in conjunction with ferrimagnetic materials to derive suitable high power harmonic suppressors. Yttrium iron garnet possessed the lowest threshold (onset of nonlinear effects) of all materials studied and could be very useful in the region of higher harmonics. Substituted garnets such as 6% holmium - 94% yttrium iron garnet possess very high thresholds and could be very applicable for the skirts of the passband. (Author)

AD-271 645 Div. 8, 26
(TISTM/EJH) OTS price $7.60

Armour Research Foundation, Chicago, Ill.
THIN FILMS FOR COMPOSITE MOLECULAR ELECTRONICS.
Final rept., May 59-Nov 61,
by F. V. Schossberger. Dec 61, 68p. incl. illus. tables, 23 refs. (Rept. no. ARF 3152-38)
(Contract AF 33(616)6445, Proj. 4150)
(ASD TDR 62-22) Unclassified report

Original contains color plates; all ASTIA reproductions will be in black and white. Original may be seen in ASTIA Hq.

DESCRIPTORS: (Semiconductors, *Thin films, *Semiconducting films, *Dielectric films, *Metal films, Manufacturing methods, Conductivity, Hall effect, Dielectric properties, Electrical properties, Crystal structure, X-ray diffraction analysis.) (Metallic smoke deposits, Surfaces, Metals, Liquid metals.) (Silicon compounds, Titanium compounds, Dioxides, Carbides, Borides, Boron, Boron compounds, Phosphides, Mercury compounds, Selenides, Tellurides, Titanium alloys, Copper alloys, Bonding, Antioxidants.)

New methods of making thin semiconducting and insulating films were investigated. An apparatus and techniques were developed for pyrolytic deposition of SiO2, BP, B, TiC, Ti boride, and SiC on induction-heated metal substrates. Electrical and crystallographic characteristics of these films were investigated. The formation of pure and doped HgSe and HgTe films on liquid Hg surfaces was investigated. Conductivity, Hall effect, and crystal structure were determined. An insulating flexible TiO2 coating on Cu was developed. The bonding characteristics of Ti-Cu alloys for ceramic, graphite, SiC, and refractory metals and the technique for making thin alloy films were studied. A new semiconducting film was prepared from oxidized Ti alloy films. (Author)

AD-271 647 Div. 8
(TISTW/DLW) OTS price $4.60

Airborne Instruments Lab., Inc., Deer Park, Long Island, N. Y.
HIGH-FREQUENCY ANTENNA TECHNIQUES.

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Quarterly rept. no. 2,
by John F. Ramsay. Nov 61, 14p. illus. (Rept. no. 1205-I-2)
(Contract AF 30(602)2529, Proj. 5582)
(RADC TDR 62-14) Unclassified report

DESCRIPTORS: (*Slot antennas, Dipole antennas, Impedance matching, Ultra high frequency, Wire, Design, Antenna radiation patterns, Measurement.) Antennas.

Investigations were made of the properties of wire-slot antennas over ground planes. Single, double, and quadruple wire-slot antennas were tested for resonant frequency, relative gain, pattern bandwidth, and impedance bandwidth. Input impedances were raised to 50 ohms by folding (for example, the folded dipole). Two techniques were developed: (1) a backscatter-measuring technique for detecting the resonant frequency of a rectangular loop and comparing its reflection with a dipole, and (2) an underground antenna technique where a wire-slot antenna radiates from a shallow trough. Preliminary measurements of skeleton slots of differing length/width ratios indicate an optimum ratio of 3 to 1 with respect to gain. The rule that makes the over-all length one wavelength applied closely for long, thin slots but may be 10% off resonance for square slots. (Author)

9. FLUID MECHANICS

AD-270 923 Div. 9
(TISTP/WH) OTS price $1.00

National Aeronautics and Space Administration, Washington, D. C.
EFFECT OF GEOMETRIC PARAMETERS ON THE STATIC PERFORMANCE OF AN ANNULAR NOZZLE WITH A CONCAVE CENTRAL BASE,
by Charles E. Mercer and Albert J. Simonson. Feb 62, 33p. incl. illus. 7 refs. (NASA Technical note D-1006)

Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical note D-1006.

DESCRIPTORS: (*Jets, *Nozzles, Thrust, Fluid mechanics.)

An experimental investigation of annular convergent nozzles with concave central bases was conducted. The effects of variation in the ratio of annulus-gap width to base radius and the ratio of annulus-gap width to base depth were examined. Thrust performance comparable to that of a conventional convergent nozzle was obtained for those configurations in which the ratio of annulus-gap width to base radius was largest, that is, approximately 0.25. In general, increasing the base depth by extending the turning lip improved thrust performance and increased pressures on the base. (Author)

AD-270 924 Div. 9
(TISTP/TL) OTS price $1.50

National Aeronautics and Space Administration, Washington, D. C.
EXPERIMENTAL SEPARATION STUDIES FOR TWO-DIMENSIONAL WEDGES AND CURVED SURFACES AT MACH NUMBERS OF 4.8 TO 6.2,
by James R. Sterrett and James C. Emery. Feb 62, 51p. incl. illus. 18 refs. (NASA Technical note D-1014)

Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical note D-1014)

DESCRIPTORS: (*Sheets, Separation, Pressure, Wedges, Curved profiles, Surface properties, *Aerodynamics, Mach number.) (Gases, Supersonic flow, Turbulent boundary layer, Shock waves, Reynolds number, Wind tunnels.) (Feasibility studies.)

An experimental investigation was made of the separation phenomena on a flat plate at Mach numbers from 4.8 to approximately 6.2. Emphasis was given to determining the maximum pressure ratio obtainable on wedges and curved surfaces without separating the turbulent boundary layer. The effective Reynolds number was changed by using different length plates and by placing roughness strips on the plates. This paper also gives some characteristics of the flow after separation has occurred and gives some insight into body forces associated with separation.

AD-270 934 Div. 9
(TISTA/SEB) OTS price $1.60

Space Sciences Lab., General Electric Co., Philadelphia, Pa.
THE EFFECT OF TEMPERATURE ON CALCULATED NON-EQUILIBRIUM ELECTRON DENSITIES,
by M. H. Bortner. Aug 61, 9p. illus., 5 refs.
(Rept. no. TIS R61SD24)
(Contract AF 04(647)269)

Unclassified report

DESCRIPTORS: (Gas flow, *Shock waves, Electrons, Density, Reaction kinetics, Temperature, Chemical reactions, Dissociation, Recombination reactions, Ionization, Theory.)

The effects of temperature and density on the chemical kinetics of a non-equilibrium flow field were studied. The kinetics were determined for systems of initial densities of 10 to the 15th, 16th, 17th, and 18th power particles per cc at constant temperatures of 20,000; 15,000; 10,000; 7000; and 5,000 K and for the case of an initial temperature of 15,000 K, the temperature decreasing due to chemical reaction. Electron densities were plotted. The expected drastic effect of temperature is found but because of the complexity of the chemical system, the effect of density is found to be somewhat different than would be predicted by simple consideration of the order of the reaction. (Author)

AD-270 966 Div. 9, 1
(TISTP/GRW) OTS price $14.00

Princeton U., N. J.
AN EXPERIMENTAL INVESTIGATION OF THE AERODYNAMIC FORCES AND MOMENTS ON A JET FLAPPED WING IN THE PRESENCE OF A PROPELLER SLIPSTREAM AND A FREE-STREAM,
by William R. Fimple. Sep 61, 30p. illus. 3 refs.
(Rept. no. 571)
(Contract Nonr-185814, Proj. NR 212-000)

Unclassified report

DESCRIPTORS: (Experimental data, *Wings, Aerodynamic configurations, *Aerodynamics, *Moments, Wind tunnels, Subsonic flow, Variable pitch propellers.) (*Short take-off planes, Aerodynamics.) (Lift, Drag.)

An experimental investigation of the aerodynamic forces and moments on a jet flapped wing in the presence of a propeller slipstream and a free-stream was conducted in the 4- x 5-ft subsonic wind tunnel. The data are presented in terms of non-dimensional coefficients, the validity of which was established over a wide range of values of the constituent variables. (Author)

AD-270 989 Div. 9
(TISTP/MFA) OTS price $3.60

Giannini Scientific Corp., Santa Ana, Calif.
IONIZATION EXPERIMENT ON AN ELECTRODELESS DISCHARGE IN A CYLINDRICAL COIL,
by H. G. Loos and R. P. Treat. Aug 61, 12p. illus.
(Contract AF 49(638)1014, Proj. 9751)
(AFOSR-1523)

Unclassified report

DESCRIPTORS: (*Gas discharges, Ionization, *Discharge tubes, *Cylindrical bodies, Coils.) (Instrumentation, Capacitors, Switches, Trigger circuits, Transmission lines.) (Photographic analysis, Schlieren photography, Oscillograms, Argon, Air.)

The breakdown of argon and air was studied for an electrodeless discharge in a straight cylindrical coil. No evidence of deviations from

axisymmetry of the discharge due to the coil junction was found. A luminous sheet was formed in all discharges, including the ones with marginal voltages. Simultaneous smear pictures and oscillograms support the assumption that the luminous sheet is a current sheet. (Author)

AD-270 990 Div. 9, 31
(TISTP/WH) OTS price $6.60

David Taylor Model Basin, Washington, D. C.
HYDROELASTIC INSTABILITY OF A CONTROL SURFACE,
by D. A. Jewell and Michael E. McCormick. Dec 61, 63p. incl. illus. tables, 20 refs. (Rept. no. 1442)

Unclassified report

DESCRIPTORS: (*Hydrofoils, Flutter, Detection, Determination.) (*Hydrodynamics, Rudder tabs, Stability, Underwater, Control surfaces.) Marine engineering.

Initial evidence of flutter of a fully submerged hydrofoil of small aspect ratio under controlled experimental conditions is presented. The influence of several primary parameters on flutter was investigated. Theodorsen's two-dimensional, unsteady flutter theory yielded flutter speed predictions in good agreement with experimental data. Based on the findings, some conditions under which flutter of displacement or hydrofoil craft could be anticipated are discussed. (Author)

AD-271 018 Div. 9, 15
(TISTP/MFA) OTS price $8.10

Boeing Scientific Research Labs., Seattle, Wash.
FURTHER INVESTIGATION OF THE HODOGRAPH TRANSFORMATION FOR IRROTATIONAL CONICAL FLOW,
by J. W. Reyn. Dec 61, 67p. illus. 8 refs.
(Document rept. no. D1-82-0145; Flight Sciences Lab. rept. no. 54)

Unclassified report

Also available from the author.

DESCRIPTORS: (*Supersonic flow, Wave analysis, *Transformations (Mathematics), Swept-forward wings, *Conical bodies.) (Differential equations, Differential geometry, Partial differential equations.)

The determination of the local properties of the hodograph transformation for irrotational conical flow by means of differential geometry was reviewed to continue the investigation for points on conical-branch lines of the first type, conical branch lines of the second type, and conical branch-limit lines, all of which are introduced. A classification of the singularities of the transformation was obtained based on the relation between the strengths of the waves, propagating along the conical characteristics and the geometry of the hodograph surface. As a further example how knowledge of the local properties of the transformation and consideration of the structure of the waves, as reflected in the shape of the hodograph surface may be useful for the formulation of a boundary value problem, the flow on the expansion side of a flat swept forward arrow wing with supersonic leading edges is discussed. Arguments are given for the non-existence of an inviscid solution above a certain critical angle of attack. (Author)

AD-271 032 Div. 9
(TISTP/WH) OTS price $9.60

Free U. Berlin (Germany).
KINETIC THEORY OF RARIFIED GASES AND OF HIGHLY HEATED DIATOMIC GASES.
Final technical rept., pt. 2, 1 Oct 60-30 Sep 61, by Gunther Ludwig. 30 Sep 61, 115p. incl. tables, 18 refs.
(Contract DA 91-591-EUC-1592)

Unclassified report

DESCRIPTORS: (*Superaerodynamics, Gas flow, Spheres, *Kinetic theory.) (Gases, *High temperature research.) (Dissociation, Shock waves.) Partial differential equations.

Chapter I. The stationary flow of a monatomic gas around a sphere is considered. For solving BOLTZMANN-equation in this case, a special iteration-process is introduced. The zeroth step is constructed with the help of an special Ansatz. The Ansatz allows the fulfilling of the demanded boundary-conditions and leads with the help of MAXWELLs transport-equations for a special molecule-model to a system of six non linear partial differential-equations. These equations are not yet solved. Chapter II. Hydrodynamic equations for polyatomic gases using an extended GRAD method are derived. The results are equations which can be simplified to equations corresponding to the NAVIER-STOKES equations for monatomic gases. Chapter III. Some numerical results about the development of the flow of a dissociating gas past a shock front are given. (Author)

AD-271 079 Div. 9
(TISTA/SEB) OTS price $1.60

Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
DISSOCIATION SCALING FOR NONEQUILIBRIUM BLUNT-NOSE FLOWS,
by Walter E. Gibson. Feb 62, 9p. incl. illus. 5 refs.
(Contract AF 40(600)928, Proj. 8951)
(AEDC TDR 62-25) Unclassified report

DESCRIPTORS: (*Blunt bodies, Gas flow, Chemical reactions, Dissociation, Recombination reactions, Hypersonics, Re-entry aerodynamics, Theory, Mathematical analysis.)

Chemical recombination can be neglected for nonequilibrium flows about blunt bodies at high altitudes of flight. Under these conditions, model scaling of nonequilibrium effects is possible. The scaling laws are demonstrated for both inviscid and fully viscous flows using a Lighthill gas model. Numerical solutions of nonequilibrium airflows with fully coupled chemistry provide a preliminary verification of such scaling for air. (Author)

AD-271 083 Div. 9
(TISTP/JW) OTS price $4.60

RCA Defense Electronic Products, Moorestown, N. J.
THREE-DIMENSIONAL EFFECTS IN VISCOUS WAKES,
Rept. on Down-Range Anti-Missile Measurements Program (DAMP),
by Martin H. Steiger and Martin H. Bloom.
Jan 62, 44p. incl. illus. table, 6 refs. (DAMP Technical monograph no. 62-03)
(Contract DA 36-034-ORD-3144)

Unclassified report

DESCRIPTORS: (*Fluid flow, Boundary layer, Energy, *Viscosity, *Wake, Velocity.) (Transformations (Mathematics), Mathematical analysis.)

The velocity, energy and concentration fields of three-dimensional viscous wakes are examined with the boundary layer approximations and Oseens' linearization of the acceleration terms. Solutions are derived for both incompressible and compressible wakes, without and with axial pressure gradients. In the incompressible cases the governing equations are linear and transform methods yield exact solutions for general types of initial conditions. In the compressible case the energy equation admits a Crocco integral when the Prandtl and Lewis numbers are equal to unity, and a similar integral of the concentration equation is derived for Le/Pr=1 and Wi tends toward 0. However, due to the nonlinearities associated with compressible flows, solutions for the velocity components can only be achieved by approximate methods. Two methods are presented; the first involves an iteration scheme, while the second assumes that the density and viscosity are only a function of the axial coordinate. In both methods transform theory is used and solutions are presented for general types of initial conditions. As an illustration, it is demonstrated that the axial velocity distribution in isobaric wakes whose initial isovels (lines of constant velocity) are of elliptic shape decay to axial symmetry. (Author)

AD-271 126 Div. 9, 25
(TISTP/GRW) OTS price $3.60

Stanford U., Calif.
THE PLANE TURBULENT WALL JET. PART II. HEAT TRANSFER,
by G. E. Myers, J. J. Schauer, and R. H. Eustis. 1 Dec 61, 26p. incl. illus. tables, 16 refs. (Technical rept. no. 2)
(NSF Grant No. 9705)
Unclassified report

DESCRIPTORS: (*Heat transfer, *Jets, Turbulent boundary layer, Surfaces, Metal plates, Copper.) (Experimental data, Integral equations.)

The heat transfer characteristics of plane, turbulent wall jets are investigated. An analytical prediction is made for the Stanton number and experimental data are presented for a step in wall temperature. The method for extending this data to arbitrary heating conditions is shown. Temperature surveys in the wall jet boundary are also presented. (Author)

AD-271 175 Div. 9
(TISTP/TL) OTS price $7.60

Stanford U., Calif.
A VISUAL STUDY OF THE FLOW MODEL IN THE LATER STAGES OF LAMINAR-TURBULENT TRANSITION ON A FLAT PLATE,
by K. A. Meyer and S. J. Kline. Dec 61, 68p. incl. illus. table, 20 refs. (Rept. no. MD-7)
(Contract AF 49(638)201)
(AFOSR TN-1875) Unclassified report

DESCRIPTORS: (Sheets, *Laminar boundary layer, Transition temperature, Configuration, Gas flow, Wedges, Separation.) (*Turbulent flow, Friction, Smokes, Dyes, Oscillations.) (Mechanics, Theory, Hydrodynamics, Stability, Anemometers, Non-linear systems, Feasibility studies, Measurement.)

A number of aspects of transition from laminar to turbulent flow were investigated on a flat plate with free stream water velocities between .75 feet per second and 1.2 feet per second. The study was primarily visual, using dye techniques, although some measurements were made using a hot film anemometer. Also investigated were the later stages of natural transition. Dye patterns associated with the chain of events leading from laminar to turbulent flow in natural transition were analyzed. (Author)

AD-271 519 Div. 9
(TISTP/JW) OTS price $.75

National Aeronautics and Space Administration, Washington, D. C.
AN ACCELERATED RESERVOIR LIGHT-GAS GUN,
by Joan S. Curtis. Feb 62, 22p. incl. illus. tables, 2 refs. (NASA Technical note D-1144)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA TN D-1144.

DESCRIPTORS: (*Hypervelocity guns, Hypervelocity projectiles, Launching, Simulation.) (*Terminal ballistics, Gas discharges.)

Simple modifications in design and operation of a 0.22-caliber piston-compression light-gas gun resulted in an increase in muzzle velocity from 15,000 to 29,700 feet per second. A contracting tapered section was added at the high-pressure end of the pump tube. The forward 4 inches of the pump piston, made of high-density polyethylene plastic, is forced to intrude into the tapered coupling and launch tube during the launching sequence. Hydrogen has been substituted for helium as the working gas. The effect on performance of varying several important parameters is demonstrated. (Author)

AD-271 529 Div. 9
(TISTA/SEB) OTS price $10.00

Aeronautical Systems Div., Air Force Systems Command, Wright-Patterson Air Force Base, Ohio.
PROCEEDINGS OF SYMPOSIUM ON AEROTHERMOELASTICITY, 30-31 OCTOBER AND 1 NOVEMBER 1961.
1961, 1023p. incl. illus. tables, refs. (ASD technical rept. no. 61-645)
Unclassified report

DESCRIPTORS: *Symposia, Airframes, Structures, *Aerodynamic heating, Thermodynamics, Dynamics, Aerodynamics, *Re-entry aerodynamics, Elasticity, Stability, Flutter, Load distribution, Hypersonics, Thermal stresses, Heat transfer, Re-entry vehicles.

A symposium on Aerothermoelasticity was held to present the latest significant developments in each scientific area and engineering area that comprise the component parts of this technology. New and significant contributions were presented in four technical areas consisting of dynamic aerothermoelasticity (flutter), stability and control, thermodynamics and aerodynamics (or aerothermodynamics), and structures including material and construction concepts. Categories important and significant to each technical area are discussed state-of-the-art wise. In addition, 26 separate papers are given on items of special importance. (Author)

AD-271 568 Div. 9
(TISTA/VGW) OTS price $3.60

Mississippi U., University.
THREE-DIMENSIONAL SEPARATION AND REATTACHMENT IN TURBULENT FLOW,
by Ernest A. Eichelbrenner. 14 Dec 61, 32p. incl. illus. (Research note no. 15)
Unclassified report

An invited lecture presented on September 24, 1961 at Mississippi State University by The Aerophysics Department.

DESCRIPTORS: (Bodies of revolution, Conical bodies, Convex bodies, Airfoils, *Ring wings, Laminar boundary layer, *Turbulent boundary layer, Separation, *Turbulent flow, Pressure, Mathematical analysis.)

The concept of wall-streamlines is shown to be a very powerful and appropriate tool for studying the behavior of laminar three-dimensional boundary-layers on convex bodies. This conception is generalized and applied to the turbulent case. The mathematical development is then applied to the case of ring airfoils. (Author)

AD-271 575 Div. 9, 12
(TISTA/LSK) OTS price $.75

National Aeronautics and Space Administration, Washington, D. C.
INVESTIGATION OF THE LOW-SUBSONIC FLIGHT CHARACTERISTICS OF A MODEL OF A REENTRY VEHICLE WITH A THICK FLAT 75 DEGREES SWEPT DELTA WING AND A HALF-CONE FUSELAGE.
by Peter C. Boisseau. Feb 62, 29p. incl. illus. table, 6 refs. (NASA Technical note D-1007)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical note D-1007.

DESCRIPTORS: (*Re-entry vehicles, *Hypervelocity vehicles, Aerodynamic configurations, Triangular wings, Wind tunnel models, Model tests, Aerodynamics, *Re-entry aerodynamics, Stability, Control, Stability (Lateral), Stability (Longitudinal), Roll, Damping.)

An investigation of the low-subsonic flight characteristics of a model having a thick flat 75 degrees swept delta wing with a half-cone fuselage on the upper surface was made in the Langley full-scale tunnel over an angle-of-attack range from about 20 to 40 degrees. Static and dynamic force test data were also obtained. The longitudinal flight characteristics were generally satisfactory over the angle-of-attack range of the investigation. Because of low damping of the Dutch roll oscillation, the lateral stability and control characteristics were poor throughout the angle-of-attack range (20 to 30 degrees) where flights were possible without artificial damping. Artificial damping in roll greatly improved the lateral characteristics so that flights could be made up to an angle of attack of about 40 degrees. (Author)

AD-271 577 Div. 9
(TISTA/SEB) OTS price $.75

National Aeronautics and Space Administration, Washington, D. C.
A CORRELATION STUDY OF THE BOW-WAVE PROFILES OF BLUNT BODIES,
by Alvin Seiff and Ellis E. Whiting. Feb 62, 29p. incl. illus. table, 12 refs. (NASA Technical note D-1148)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical note D-1148.

DESCRIPTORS: (Bodies of revolution, *Blunt bodies, Cylindrical bodies, Shock waves, Blast, Fluid flow, Gas flow, Thermodynamics, Enthalpy, Supersonics, Hypersonics, Mathematical analysis, Equations, Theory.)

Existing shadowgraph data and data from exact flow solutions for the bow-wave profiles generated by blunt-nosed bodies of revolution are studied with the objective of obtaining systematic descriptions of the wave profiles and their dependence on nose shape, Mach number, and total enthalpy. The waves are represented by power-law expressions of the kind suggested by blast-wave theory, and correlations of the constants in the equations are investigated. The study includes seven nose shapes, Mach numbers from 3.5 to 19.3, and total enthalpies from 400 to 8100 Btu/lb. (Author)

AD-271 607 Div. 9
(TISTP/JW) OTS price $1.60

Boeing Scientific Research Labs., Seattle, Wash.
FURTHER REMARKS ON THE STABILITY OF PLANE POISEUILLE FLOW BETWEEN FLEXIBLE WALLS,
by F. D. Hains and J. F. Price. Dec 61, 12p. incl. illus. 1 ref. (Rept. no. D1-82-0144)
Unclassified report

Also available from the author.

DESCRIPTORS: (*Fluid flow, Elasticity, Stability, Tensile properties, Damping.) (*Integral equations, *Reynolds number.)

The principles of plane Poiseuille flow are applied to problems involving 2 classes of flexible walls. The first class consists of those with tension only. The shape of these curves are deduced from those of the previous report and are verified by numerical calculation. It is found that reduction in tension from the infinite value associated with a rigid wall results in the closing and shrinking of the neutral stability curves. Below a certain critical value of tension when the region of instability is a point, the flow is completely stabilized. The second class deals with walls with the same tension, but different values of damping. The critical Reynolds number is increased about seventeen percent as damping is added to the wall. An optimum condition is reached beyond which added damping reduces the critical Reynolds number. The effect of damping may be different for walls with other values of tension. (Author)

AD-271 614 Div. 9
(TISTP/MFA) OTS price $6.60

Hudson Lab., Columbia U., Dobbs Ferry, N. Y.
ON THE STABILITY OF FLOW OF A THERMALLY STRATIFIED FLUID UNDER THE ACTION OF GRAVITY,
by Donald Koppel. 19 July 61, 63p. incl. illus. 9 refs. (Rept. no. CU-112-62; Technical rept. no. 89)
(Contract Nonr-266(84))
Unclassified report

DESCRIPTORS: (*Stability of *Fluid flow, Viscosity, Thermal conductivity, Heat, Temperature.) (Partial differential equations, Series, Integration, Complex variables.)

The equation for the small disturbances from the plane-parallel flow of a thermally stratified fluid under the influence of gravity acting perpendicular to the plane of stratification is derived. It was found necessary to include not only viscosity but also heat conductivity to preclude the resulting differential equation from having a singularity. Asymptotic solutions of the sixth order differential equation thus derived are obtained. They show the presence of a Stokes point. The limiting form of the differential equation near the Stokes point is next obtained and an exact solution of this equation is derived by means of a Laplace transformation. In the general case the integrand of the Laplace transformation involves Whittaker's confluent hypergeometric functions. In the special case of a Prandtl number of 1, the integrand is considerably simpler and for this case asymptotic representations of the solutions on both sides of the Stokes point have been derived from the Laplace transformation solution by the method of steepest descent. (Author)

AD-271 646 Div. 9, 25
(TISTP/TL) OTS price $1.10

Institute of Engineering Research, U. of Calif., Berkeley.
A NOTE ON THE STAGNATION-POINT LANGMUIR PROBE.
by L. Talbot. 15 Dec 61, 6p. incl. illus. 3 refs. (Series no. 132, Issue no. 4; Rept. no. HE-150-195)
(Contract AF 49 (638)502)
Unclassified report

DESCRIPTORS: (*Supersonic flow, *Gas ionization, *Fluid mechanics, *Plasma physics.) (Diffusion, Pressure, *Boundary layer.) (Shock waves, Ions, Density, Temperature, Cooling.) (Wind tunnels, Electric arcs, Heating.) Differential equations.

The stagnation-point Langmuir probe theory is presented, valid for supersonic flow with completely frozen but low degree of ionization. It is shown that under certain cold-wall conditions, diffusion and compression within a region of the stagnation point the boundary layer act to exactly balance one another, with the result that the ion density remains constant throughout this region, and thus the probe characteristic curve exhibits a nearly constant ion saturation limit. (Author)

10. FUELS AND COMBUSTION

AD-270 929 Div. 10
(TISTM/EJH) OTS price $3.60

Atlantic Research Corp., Alexandria, Va.
RESEARCH ON SOLID-PROPELLANT COMBUSTION.
Final technical rept.,
by Raymond Friedman and Joseph B. Levy.
31 Dec 61, 35p. incl. illus. 30 refs.
(Contract AF 49(638)813)
(AFOSR-2005) Unclassified report

DESCRIPTORS: (*Solid rocket propellants, *Rocket oxidizers, *Combustion, Ignition, Reaction kinetics, Flames, Flame propagation, Pressure, Theory, Decomposition, Thermochemistry.) (*Perchloric acids, Vapors, Chemical reactions, Ammonia.) (Ammonium radicals, Potassium compounds, *Perchlorates and Methanes, Mixtures of Binders, Polymers, Vinylchlorides, Carboxylic acids.)

Contents:
Experiments with NH_3 and $HClO_4$
Experiments on NH_4ClO_4 and $KClO_4$ deflagration:
Pressure limit of flammability
Effects of preheating on combustion of NH_4ClO_4
Interactions of deflagrating NH_4ClO_4 with CH_4
Interactions of deflagrating NH_4ClO_4 with a polymer
Experiments with $KClO_4$ pressed strands
Review of present knowledge of combustion mechanism of NH_4ClO_4 based composite solid propellants
Simplified equations for monopropellant combustion

AD-270 941 Div. 10
(TISTM/EJH) OTS price $6.60

Research Inst., Temple U., Philadelphia, Pa.
EXPLORATORY RESEARCH ON HIGH ENERGY PROPELLANT SYSTEMS.
Final rept. 4 Jan 60-4 Mar 61,
by A. V. Grosse, T. R. Flint and others.
Jan 61, 59p. incl. illus. tables, 17 refs.
(Contract DA 36-034-ORD-3152)
Unclassified report

DESCRIPTORS: (*Liquid rocket propellants, *Rocket oxidizers, Rocket fuels, Chemical properties, Combustion, *Ignition, Stability, Specific impulse, Theory.) (Liquefied gases, Oxygen, Oxygen compounds, Ozone, Fluorides, Pentaboranes, Diboranes, Fluorine.) (Rocket motors, Model tests, Test methods, Test equipment, Design.)

A versatile liquid propellant evaluation system was perfected which is suitable for use with laboratory quantities (50 to 200 ml) of regular or cryogenic fuels and oxidizers. Tests with the RP-1-LOX system provided values for specific impulse on the order of 90% of theoretical. Data from a test of the pentaborane-fluorine system yielded a specific impulse which was 83% of theoretical. A dilute solution (0.05%) of O_3F_2 in liquid O was used as an oxidizer in the apparatus and proved to hypergolic with gaseous H_2, UDMH, UDMH-DETA, E & OH, C_3H_8, n-hexane, JP-4, and mixtures of JP-4 and UDMH. Compatibility tests (by simple contact) showed that dilute O_3F_2 -LOX solutions do not react hypergolically with most materials commonly used in LOX systems. (Author)

AD-270 973 Div. 10, 14, 25
(TISTM/EJH) OTS price $6.60

Little, Arthur D., Inc., Cambridge, Mass.
ANALYSIS OF THERMAL PROTECTION SYSTEMS FOR PROPELLANT STORAGE DURING SPACE MISSIONS.
Technical rept. on Liquid Propellant Losses During Space Flight.
Dec 61, 55p. incl. illus. table, 28 refs.
(Rept. no. 63270-04-03)
(Contract NAS 5-664)
Unclassified report

DESCRIPTORS: (*Liquid rocket propellants, Satellite vehicles, Spaceships, *Storage, Propellant tanks, Thermal radiation, Attenuation, *Thermal insulation, Laminates, Foils, Aluminum, Glass textiles, Plastics, Thermal conductivity, Heat transfer, Boiling, Mathematical analysis.) (Radiation effects, Shielding, Feasibility studies, Theory.)

Additional techniques are discussed for heat-transfer computation, and information about materials, so that the development and analysis of concepts for storage system design can be made on a more realistic and quantitative basis than has been done in the feasibility studies. Approximations based on an anisotropic model, in which the parallel component of conductivity is assumed zero, result in the minimum estimate of boil-off. The treatments using ideal formulae for the behavior of multiple-foil insulation are of this type. The most desirable insulation media are those with very low parallel conductivity. Whenever practical, the basic arrangement of major components of the vehicle should be such that the average temperature varies monotonically from one end to the other. Orientation so that the major exposed portions of the vehicle are shadowed seems highly desirable. (Author)

AD-270 974 Div. 10, 12
(TISTW/EET) OTS price $11.00

Little, Arthur D., Inc., Cambridge, Mass.
LIQUID PROPELLANT LOSSES DURING SPACE FLIGHT.
Quarterly progress rept. nos. 3-4, 1 June-30 Nov 61.
30 Nov 61, 137p. incl. illus. tables, 60 refs.
(Rept. no. 63270-00-03)
(Contract NAS5-664)

Unclassified report

DESCRIPTORS: *Liquid rocket propellants, *Space environmental conditions, Storage, Thermal radiation, Thermal insulation, Cratering, Impact shock, Ionization, Radiation damage, Heat transfer, Propellant tanks, Spallation, Thermal conductivity. (*Space flight, *Satellite vehicles, Hypervelocity vehicles, Meteors, Hazards.)

Contents:
- Analytical studies of thermal protection systems
  - Control of inter-component heat leaks due to supports and piping
  - Heat in leakage due to discontinuities
  - Effect of gas leaks or outgassing on heat transfer between foils
  - Incident heat flux for the general vehicle and orbit
- Experimental study of thermal interactions
  - Calibration data
- Study of meteoroid interactions
  - The meteoroid hazard
  - The physics of meteor bumper penetration
  - Experimental evaluation of meteor bumper
  - A satellite experiment for observing the meteoroid flux and size distribution
- Effect of zero G on the storage of liquid propellants
- Effect of ionizing radiation and other space environmental factors on the thermal decomposition of energetic propellants

AD-271 001 Div. 10, 4
(TISTM/GEC) OTS price $1.10

Naval Research Lab., Washington, D. C.
LEAK-INDICATING PAINTS FOR ROCKET-FUEL TANKS AND STORAGE AREAS.
Final rept.,
by J. R. Griffith. 18 Jan 62, 5p. incl. illus.
(NRL rept. no. 5735)

Unclassified report

Original contains color plates; all ASTIA reproductions will be in black and white. Original may be seen in ASTIA Hq.

DESCRIPTORS: (*Fuel storage tanks and *Propellant tanks for Liquid rocket propellants and Rocket oxidizers, Storage, Hazards, Reliability.) (*Paints, Coatings, *Chemical indicators.) Naval vessels.

A study was made to find indicators for addition to paints for use on missiles and ship magazines which would undergo color changes upon being exposed to certain fuels. It was desired that the paints be white or of light colors, preferably blue, yellow, or orange. It was also desired that the paints be capable of detecting leaks of hydrazine-based fuels, as well as oxidizers such as fuming nitric acids or halogen compounds. The color responses were desired to be such that an observer's attention would be attracted by the contrast, so that he could tell immediately whether fuel or oxidizer was escaping. Lacquers and enamels were developed that undergo vivid color changes upon being exposed to propellants containing substituted hydrazine, nitric acids, or elemental halogens. These paints, which are suitable for use on missiles and missile-storage areas, increased the probability that fuel leaks would be detected before damage occurs. (Author)

AD-271 055 Div. 10, 25
(TISTM/TCG) OTS price $1.60

Midwest Research Inst., Kansas City, Mo.
MASS SPECTROMETER STUDY OF METAL-CONTAINING FLAMES.
Quarterly technical summary rept. no. 1, 1 Oct-31 Dec 61,
by Thomas A. Milne. 31 Dec 61, 7p. incl. illus. 5 refs.
(Contract Nonr-359900)

Unclassified report

DESCRIPTORS: (Thermodynamics, *Flames with Gases, Metals, *Mass spectroscopy, Mass spectrometers, Sampling.)

An experimental program designed to study the thermodynamics of metal containing gaseous species in the burnt-gas region of flames by means of mass spectrometric sampling is being undertaken. The initial work involves the design and construction of a differentially pumped system to allow sampling of one-atmosphere flames with a Bendix time-of-flight spectrometer. This system will be tested with several simple gases and reactions. (Author)

AD-271 125 Div. 10, 4
(TISTM/TCG) OTS price $1.50

Stanford Research Inst., Menlo Park, Calif.
STUDY OF THE MECHANISMS OF FIRE EXTINGUISHMENT OF PROPELLANTS.
Rept. for 1 Nov 59-Apr 61,
by Willis A. Rosser, Jr., S. Henry Inami, and Henry Wise. July 61, 48p. incl. illus. tables, 19 refs.
(Contract AF 33(616)6853, Proj. 6075)
(ASD TR 61-143)

Unclassified report

DESCRIPTORS: (Inhibition of *Combustion, Flame propagation, *Propellants, Hydrocarbons by Halogen compounds, Metals, Powder metals.) (Vaporization, Surface area, Particles, Absorption, Specific heat.) (Phosphorus compounds, Sulfur compounds, Boron compounds, Fluorides, Bromides, Chlorides, Halides, Oxychlorides.) (Calcium compounds, Sodium compounds, Potassium compounds, Carbonates.) Methanes.

A study was made of the inhibition of various premixed flames by 2 classes of chemicals: volatile halogen-containing compounds and finely divided powders. Some of each class were effective inhibitors of hydrocarbon combustion. Inhibition by volatile halogen compounds involves at least 2 types of reaction: (a) between chain carriers and the undecomposed halogen compound, and (b) between chain carriers and the decomposition or oxidation products of the halogen compound. Inhibition by powders probably involves these successive steps: heating the powder particles to a high temperature by the hot flame gases, partial evaporation of the powder particles, decomposition or reaction of the evaporated material to provide metal atoms, and inhibition of the combustion process by the liberated metal atoms. It is believed that combustion is impeded by deactivating excited molecules which may be important intermediates in the burning process. (Author)

AD-271 360 Div. 10, 4
(TISTM/TCG) OTS price $3.60

Texaco Experiment, Inc., Richmond, Va.
RECOMBINATION OF IONS IN FLAMES,
by I. R. King. 15 Dec 61, 30p. incl. illus. tables, 25 refs. (Technical pub. no. 174A; EXP-278)
(Contract AF 49(638)650, Proj. 9751)
(AFOSR-596) Unclassified report

DESCRIPTORS: (*Recombination reactions, *Reaction kinetics, *Ions, *Flames, Combustion.) (Chemical reactions, Temperature, Pressure, Gases, Tests, Theory.) (Hydroxides, Tritium oxide, Ions.) (Methanes, Propanes, Acetylenes, Chlorine.)

A technique for measuring recombination rates in flames is described and some results showing the effect of temperature, pressure, and the presence of electronegative gases on recombination are presented. Experimental results are compared with predictions based on present-day theories of recombination. Results are interpreted in terms of an ion-ion process with recombination occurring most probably between an OH(-) and an H3O(+) ion. The importance of electron attachment in such a process is emphasized. (Author)

AD-271 373 Div. 10, 4
(TISTA/LSK) OTS price $2.60

Air Products and Chemicals, Inc., Allentown, Pa.
STUDY OF LIQUID OXYGEN CONTAMINATION.
Progress rept. no. 6,
by R. H. Foster and S. T. Stoy. Jan 61, 18p. incl. illus. 8 refs.
(Contract AF 33(616)6730, Proj. 3148)
Unclassified report

DESCRIPTORS: (*Oxygen, *Liquefied gases, *Liquid rocket propellants, Rocket oxidizers, Contamination, Purification, Chemical impurities, Hydrocarbons, Solidified gases, Carbon dioxide, Handling, Safety, *Fuel filters, Design.)

A description is presented of the work performed on filtration of solid carbon dioxide particles from liquid oxygen and on ignition of hydrocarbon films in oxygen atmospheres. An investigation of commercial filter assemblies satisfactory for liquid oxygen service was undertaken. The results of this work indicate that a maximum safe level of hydrocarbon (hexadecane) film contamination is 100 milligrams per square foot. (Author)

AD-271 375 Div. 10, 27, 9
(TISTA/SEB) OTS price $2.60

Applied Physics Lab., Johns Hopkins U., Silver Spring, Md.
TASK R.
Quarterly progress rept. no. 11, 1 Oct-31 Dec 61. 31 Dec 61, 23p. incl. illus. tables, refs.
(Rept. no. TG 331-11)
(Contract NOrd-7386)
Unclassified report

DESCRIPTORS: (Rocket motors, *Solid rocket propellants, Combustion, Combustion chamber gases, Exhaust gases, Exhaust flames, Thermal conductivity, Reaction kinetics, Chemical reactions, Dissociation, Condensation reactions, Recombination reactions, Tests.) (*Rocket motor nozzles, Flames, Gas flow, Boundary layer, Laminar boundary layer, Turbulent boundary layer, Heat transfer, Thermodynamics.) (Test methods, Test equipment.)

HIGH TEMPERATURE KINETICS IN LAMINAR FLAMES: Work continued on the scavenger probe sampling technique for O-atoms in a CH4-O2 flame. THERMAL CONDUCTIVITY OF GASES: Tests of the equipment being assembled to furnish known H2O-O2 mixtures for thermal conductivity measurement using the line source technique are described. ROCKET NOZZLE FLUID DYNAMICS: Boundary layer pressure and temperature measurements are given for the Mach 4.2 station, and their heat transfer significance discussed. ROCKET NOZZLE CHEMICAL KINETICS: A new set of numerical solutions for the flow of a complex propellant gas in the expanding portion of a nozzle are presented. (Author)

AD-271 461 Div. 10, 25
(TISTP/JW) OTS price $3.60

Forest Service, Washington, D. C.
TRANSFER OF HEAT BY FORCED CONVECTION FROM A LINE COMBUSTION SOURCE--THE INFLUENCE OF ATMOSPHERIC STABILITY AND SURFACE ROUGHNESS.
Interim technical rept.,
by S. Scesa. Feb 57, 40p. incl. illus. tables, 9 refs.
(AFSWP-865) Unclassified report

DESCRIPTORS: (Fluid flow, *Heat transfer, Gases, Combustion, Thermal conductivity.) (*Combustion, Convection, Conductivity.) (Atmosphere, Stability.) Forest fires, Partial differential equations.

Fundamental equations of conservation of mass, momentum, and energy are applied to the problem of heat transmission by forced convection from

a line combustion source. The influence of atmospheric stability and surface roughness on growth of the heated zone, decay of temperature from the heat source, and aerodynamic drag is presented. Theory presents groupings of the variables that are common to heat transfer and fluid flow problems concerning the surface air layer. Results reveal that atmospheric stability plays an important role in the growth of the heated region, decay of temperature, and aerodynamic drag for small values of friction velocity and macroviscosity parameter. For large values of these parameters (large surface roughness), atmospheric stability is not important. (Author)

AD-271 466 Div. 10
(TISTA/SEB) OTS price $5.60

Little, Arthur D., Cambridge, Mass.
INVESTIGATION OF PARAMETERS AFFECTING AIRCRAFT AND MISSILES FUEL FILTRATION.
Rept. for Feb 60-Oct 60 on Liquid Propellant Servicing Equipment,
by Peter A. Reiman. May 61, 49p. incl. illus. tables, 11 refs.
(Contract AF 33(616)6386, Proj. 6054)
(WADD TR 60-263, pt. 2) Unclassified report

DESCRIPTORS: (*Jet engine fuels, Aviation fuels, Rocket fuels, *Liquid rocket propellants, Contamination, Impurities, Water, Solids, Particles, Purification, Separation, Tests.) (Fuel filters, *Centrifuge separation, *Electrostatic precipitation.)

AD-271 508 Div. 10, 4
(TISTA/SEB) OTS price $2.60

Aeronutronic, Newport Beach, Calif.
THERMODYNAMIC PROPERTIES OF ROCKET COMBUSTION PRODUCTS.
Quarterly technical progress rept. no. 2,
by D. L. Hildenbrand and L. P. Theard. 1 Feb 62, 24p. incl. illus. tables, 9 refs.
(Pub. no. U-1546)
(Contract AF 04(611)7422)
Unclassified report

DESCRIPTORS: (Solid rocket propellants, Liquid rocket propellants, *Fuel additives, *Beryllium, Beryllium compounds, Oxides, Combustion, Chemical reactions, Thermodynamics, Tests.) (Combustion chamber gases, Exhaust gases, Hydrogen, Beryllium compounds, Hydroxides, Vapors, Heat of formation, Mass spectroscopy, Spectrographic analysis.)

Reaction of water vapor with the Ta heat shields is responsible for H production. A new reaction cell, also made of W, is described. Mass spectrometric studies of the BeO-H2O system at 1938 K, showed no detectable amounts of gaseous OH species present. A lower limit of -181 kcal/mole for the heat of formation of Be(OH)2 (g) at 298 K was derived. A mixture of Be metal and BeO in the mass spectrometer gave evidence for the presence of Be(g) in the effusing vapor at temperatures up to 1800 K. Mass spectra for the Be-BeO mixture in the presence of water vapor contained no measurable intensities of BeOH+ at 1800 K. A lower limit of -21 kcal/mole was derived for the heat of formation of BeOH(g) at 289 K. A table of thermodynamic functions for condensed BeO was compiled. The vapor pressure of crystalline BeF2 was measured by the torsion-effusion method over the range of 810 to 925 K. Average of second and third law values of the heat of sublimation of BeF2 at 298 K is 58.0 + or -2 kcal/mole. (Author)

The feasibility of various alternate methods of removing free water, dissolved water and solids from military aviation fuels was investigated. Although electrostatic and centrifugal techniques are available for removal of free water and solids, these methods are cumbersome and expensive. They offer no real advantage over filter/separation. (Author)

AD-271 597 Div. 10, 25, 30
(TISTM/GEC) OTS price $4.60

Armour Research Foundation, Chicago, Ill.
FUNDAMENTALS OF LIQUID PROPELLANT SENSITIVITY.
Quarterly rept. no. 2, 13 Sep-13 Dec 61,
by T. A. Erikson and E. L. Grove. 30 Jan 62, 39p. incl. illus. tables (Rept. no. ARF-3197-6)
(Contract NOw 61-0603-c, Proj. C 197)
Unclassified report

DESCRIPTORS: (*Liquid rocket propellants, *Nitroglycerine, Sensitivity, Detonation, Tests.) (Test methods, Vapor pressure, Surface tension, Heating, Heat transfer, *Photolysis, Xenon lamps, Infrared radiation, Ultraviolet radiation, *Photochemical reactions.) (Absorption, Water.) (Time, Temperature, Pressure, Shock tubes.)

The study of liquid propellant sensitivity continued. Positively identified, shock-tube-initiated detonations of liquid nitroglycerine were achieved after evacuation of the sample in the shock tube was eliminated from the test procedure. Apparently evacuation removed volatile sensitizing agents and thus desensitized the nitroglycerine sample to the shock-tube test. In 50 tests with samples that were not desensitized, the time delay was found to decrease from 100 to 25 microseconds when the Mach number of the incident shock was raised from about 3 to 5. Photolysis experiments indicated that a light of an absorptive wavelength caused self-heating of the nitroglycerine until either decomposition or detonation occurred, depending on the geometrics of the particular experiment. Measurements showed that water vapor rapidly contaminated the surface of nitroglycerine, as indicated by a change in surface tension, from about 50 to 55 dynes/cm, within a few hours. Over a month of storage, the surface tension of a sample of nitroglycerine was observed to increase by about 3 dynes/cm. (Author)

11. GROUND TRANSPORTATION EQUIPMENT

AD-271 610 Div. 11
(TISTW/EET) OTS price $1.10

Continental Army Command, Fort Monroe, Va.
USCONARC-APPROVED MILITARY CHARACTERISTICS FOR TRUCK, WRECKER, GOER-TYPE, 10-TON.
22 Sep 61, 8p.
Unclassified report

DESCRIPTORS: (Mobile, *Recovery vehicles, *Cargo vehicles, Design, Feasibility studies for Military operations and Army operations.) (*Vehicles, Air transportation, Railroads, Maintenance vehicles, Maintenance tools, Military transportation, Tracked vehicles, Maintenance.)

A wrecker vehicle with an off-road performance equal to that of GOER-type transport vehicles is required. It must possess an inherent swimming capability, improved fuel consumption rate over that of conventional-type vehicles, require minimum maintenance, and be air transportable in Phase III of airborne operations. It will be employed in situations requiring maximum mobility and may replace or reduce requirements for several types of existing wreckers for certain uses. This vehicle will be used for organizational and field maintenance support of tracked and wheeled vehicles. (Author)

12. GUIDED MISSILES

AD-270 925 Div. 12, 19
(TISTW/EET) OTS price $1.00

National Aeronautics and Space Administration, Washington, D. C.
A STUDY OF GUIDANCE SENSITIVITY FOR VARIOUS LOW-THRUST TRANSFERS FROM EARTH TO MARS,
by Alan L. Friedlander. Feb 62, 40p. incl. tables, 9 refs.
(NASA Technical note D-1183)
Unclassified report

Also available from NASA, Wash. 25, D. C. as NASA Technical note D-1187.

DESCRIPTORS: (*Space flight, Mars, *Space navigation, *Guidance, Sensitivity, Perturbation theory, Mathematical logic, Vector analysis, Specific impulse, Orbital flight paths.)

An analysis of guidance sensitivity based on methods of linear perturbation theory and adjoint functions is presented. The fundamental guidance equation is derived and its interpretations are discussed. The characteristics of the sensitivity coefficients and functions for a typical low-thrust trajectory are described. The effects of initial velocity errors on the final position and velocity are presented for extensive range of initial thrust-weight ratio, specific impulse, and transfer time.

AD-270 936 Div. 12
(TISTW/DLW) OTS price $1.60

General Dynamics/Convair, San Diego, Calif.
A PRELIMINARY STUDY OF THE ATTACK PHASE OF A TELEVISION-GUIDED AIR-TO-SURFACE GLIDE MISSILE,
by E. H. Price. 23 Oct 61, 14p. incl. illus.
(Rept. no. ERR-SD-145)
Unclassified report

DESCRIPTORS: (*Guided bombs, Guided missiles, Air-to-surface, *Television guidance, Velocity, Maneuverability, Target recognitions, Surface targets, Interception probability, Terminal ballistics, Simulation, Mathematical prediction.)

The results are presented of a preliminary analytical study of some of the basic parameters defining the terminal attack phase of a television-guided air-to-surface missile. It was not the intent of the study to design a particular system but to provide a technical background upon which to base comparisons of different airframe and optical configurations. The parameters of primary interest were missile velocity, target recognition range, maneuvering acceleration limit, target coverage area, and field of view. (Author)

AD-271 033 Div. 12, 2
(TISTB/AW) OTS price $10.50

Lockheed Aircraft Corp., Sunnyvale, Calif.
ANNOTATED BIBLIOGRAPHY OF LUNAR PROPERTIES, GEOLOGY, VEHICLES AND BASES. PART II. VEHICLES, TRAJECTORIES, AND LANDINGS,
comp. by A. A. Beltran, J. B. Goldmann, and E. E. Graziano. Dec 61, 296p. refs. (Special bibliography no. SB-61-67; Rept. no. 5-53-61-2)
Unclassified report

DESCRIPTORS: (*Bibliography, *Moon, Geology, Spaceships, Lunar probes, Manned, Guided missile trajectories, Rocket trajectories, Satellite vehicle trajectories, Landing.)

Part II of this three part lunar bibliography is concerned with manned and unmanned lunar probes, their purpose, trajectories, instrumentation, ground support, and landing site selection. Manned vehicle equipment, communications, number of crew, crew requirements, and landings are also covered, as are manned and unmanned space stations. Part I dealt with the physical properties, geology, volcanism, selenomorphology, mineralogy and maps of the moon. Part III will cover fixed and mobile lunar bases, construction problems, lunar surface vehicles, and the methods and feasibility of human habitation. Arctic exploration, including base construction, surface vehicles, clothing and equipment, and environmental effects on man is included because of its applicability to lunar bases and exploration. (Author)

AD-271 039 Div. 12, 30
(TISTP/WH) OTS price $5.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
SIGNAL FLOW GRAPH ANALYSIS OF ELECTROMECHANICAL SYSTEMS.
Technical rept. on Mathematics,
by J. L. Burroughs and W. W. Happ. Nov 61, 45p. incl. illus. tables, 4 refs. (Rept. no. LMSC 6-90-61-120).
Unclassified report

DESCRIPTORS: (*Servomechanisms, Analysis, Electric servomechanisms, *Simulation, Analog systems.) (Electric motors, Analysis, Numerical methods and procedures.)

The equations of a single loop of wire moving in a time varying magnetic field are used to derive the signal flow graph of individual electrical machine windings. The signal flow graphs of the windings are interconnected to form the signal flow graphs of various electrical machines; and the signal flow graphs of the machines are interconnected to form the signal flow graph of a complete servosystem. Systematic interconnection of component flow graphs is made possible by the use of conjugate variables to describe the power flow between coupled components. The resulting signal flow graph of the servosystem involves 13 feedback loops. Partial factoring and numerical approximations are used to simplify evaluation of critical frequencies from the system flow graph. (Author)

AD-271 082 Div. 12, 2
(TISTW/DLW) OTS price $2.60

Army Signal Missile Support Agency, White Sands Missile Range, N. Mex.
LOW LEVEL WIND MEASUREMENTS FOR BALLISTIC APPLICATION,
by Robert N. Swanson. Jan 62, 23p. incl. illus. tables, 27 refs. (Technical rept. no. 116)
Unclassified report

DESCRIPTORS: (*Guided missiles, Surface to surface, Launching, Launching sites, Meteorological data, *Wind, *Turbulence, *Guided missile trajectories, Drift, Mathematical prediction, Measurement, Taylor's series, Statistical functions.)

Application of the low level wind turbulence spectrum to the ballistic missile problem with the aid of Taylor's hypothesis is discussed. Results of cross-spectral analysis are discussed with reference to predicting the wind at the launcher from a sensor at some point in space away from the launcher. Examples of spectral and cross-spectral estimates are presented. (Author)

AD-271 099 Div. 12, 27
(TISTW/EET) OTS price $3.60

Diamond Ordnance Fuze Labs., Washington, D. C.
INSTRUMENTATION AND COMPENSATION FOR ACCURATE CUTOFF VELOCITY,
by L. M. Andrews and H. J. Rosenberg. 20 Dec 61, 34p. incl. illus. (DOLF rept. no. TR-986)
(Proj. 30400)
Unclassified report

DESCRIPTORS: (*Guided missiles, *Velocity, Measurement with Radar equipment and Accelerometers, Mathematical analysis.) (Guided missiles, Surface to surface, Control systems, Range, Velocity, Determination.) (Control of Combustion of Rocket motors by Determination of Surface to surface, Guided missiles, Velocity.) Guided missile trajectories, Acceleration, Digital systems, Errors, Vibration.

The recognition of a preselected velocity to determine the cutoff point of a missile rocket motor is discussed. Velocity can be measured either by a ground-missile radar system or a missile inertial (accelerometer) system. Error compensation methods are formulated for both velocity measuring systems and basic instrumentation requirements for the inertial system are discussed. (Author)

AD-271 112 Div. 12, 30, 14
(TISTW/JRG) OTS price $5.60

Naval Ordnance Lab., White Oak, Md.
ABLATION TEST METHODS FOR ROCKET AND HEAT SHIELD MATERIALS,
by F. A. Mihalow, F. J. Koubek, and H. A. Perry.
1 Oct 60, 18p. illus. table.
(NAVWEPS rept. no. 7314)
Unclassified report

DESCRIPTORS: (High temperature research, Test equipment, Test methods, *Thermal insulation, Heat, *Insulating materials, Heat resistant polymers, Refractory materials, *Ablation, *Guided missiles, *Re-entry vehicles, *Rocket cases, *Rocket motor nozzles.) (Measurement, Temperature, Thermal diffusion, Mathematical analysis.) (Oxygen, Acetylenes, Welding, Flames.)

Two test procedures for evaluating materials in dynamic hot gas environments are described. The first is the NOL Panel Test which gives relative insulation performance data with a min of expense and time. The second, the NOL Alpha Rod Test, while more time consuming and requiring greater preparation, gives information on ablation rate and effective thermal diffusivity of insulating type materials. The latter test is relatively new and not all of the experimental parameters have been evaluated. Some sample data from each type of test are presented. (Author)

AD-271 146 Div. 12, 25
(TISTP/JW) OTS price $2.60

Illinois U., Urbana.
MASS UNBALANCE IN A SIMPLIFIED AUTOSPIN SYSTEM. Interim technical rept. no. 4 on An Analysis of the Motion of Missiles,
by J. M. Doyle. Jan 62, 24p. incl. illus. (T&AM rept. no. 206)
(Contract DA 11-002-506-ORD-3488, Proj. TW-205)
Unclassified report

DESCRIPTORS: (Spin, *Motion, Rotation, Equations.) (Guided missile trajectories, *Rocket motors, Fuel cells.) (Dynamics, Ballistics, Guided missiles.) *Stabilization systems.

An autospin system, consisting of a two part missile mounted on a common axis such that a slow spin can be imparted to the rocket motor by an internal angular impulse, is analyzed to determine the effect of mass unbalance on the trajectory. The equations of motion are linearized and the entire fuel cell is assumed to be discharged as a single rigid body. (Author)

AD-271 152 Div. 12, 30
(TISTW/EET) OTS price $2.60

Kidde, Walter, and Co., Inc., Bellevue, N. J.
FIBERGLASS MOTOR CASE STUDY. POLARIS SECOND STAGE END CLOSURE.
Progress rept., 1-31 Dec 61,
by T. Siuta. 16 Jan 62, 13p. illus. (Rept. no. 3642-9)
(Contract NOw 61-0497-c)
Unclassified report

DESCRIPTORS: (*Guided missiles, Underwater to surface, Rocket motors, *Rocket cases, Glass textiles, Filament-wound construction, Hydrostatic pressure, Stresses, Tests, Model tests.)

Work was continued to determine the deflection characteristics of the scale model rocket case. A duplicate of the initial 1/4 scale model case was fabricated and hydrostatically tested. The test data was reduced and a preliminary analysis was made. A simplified analysis was made for the reinforcement of the off-center ports and available deflection data on full scale cases was reviewed. (Author)

AD-271 193 Div. 12, 29
(TISTW/JRG) OTS price $1.60

Ogden Air Material Area, Hill Air Force Base, Utah.
DROP TESTS OF THE MODIFIED MK 8 CONTAINER FOR THE ROCKET MOTOR M60 (GAR 11).
Airmunitions test rept.,
by Paul P. Jennens. Jan 62, 14p. incl. illus.
(Rept. no. OOY TR 62-2)
Unclassified report

DESCRIPTORS: (*Guided missiles, Air to air, *Rocket motors, Shipping, *Containers, Impact shock, Tests, Handling, Pressure.)

A test was made to determine if the modified Mk 8 Mod 0 shipping container could qualify as a suitable container for the shipment of the M60 rocket motor (used in the GAR 11). The container was previously used to store bags of 16 in. gun propellant. The containers were modified by cutting out a 13 in. section and welding it together. Eleven Mk8 containers and 12 rocket motors, M60, were subjected to 48-in. drop tests

in vertical and horizontal attitudes. One container was subjected to eight 30 in. drop tests on the upper and lower rims. The containers were pressurized for leak tests before and after the drop tests. The rocket motors were x-rayed before and after the drop tests. The containers were slightly damaged (.25-in dents in the lower rim) in the 48-in. and 30-in. drop test. The pressure retention of the containers was about the same after the drop tests as it was before the tests. No damage was sustained by the motor as noted by visual examination, x-ray, or nozzle alignment. It is recommended that the motors subjected to drops of 48 in. or less while enclosed in their shipping containers be determined serviceable. (Author)

AD-271 382 Div. 12
(TISTA/SEB) OTS price $6.60

Applied Physics Lab., Johns Hopkins U., Silver Spring, Md.
DESIGN AND DEVELOPMENT OF THE TRANSIT NAVIGATIONAL SATELLITE,
by M. A. Schreiber and T. Wyatt. May 61, 55p. incl. illus. tables, 8 refs. (Rept. no. CM-994A)
(Contract NOrd-7386)
Unclassified report

DESCRIPTORS: (Satellite vehicles, Navigation, *Doppler navigation, Doppler systems, Satellite vehicle antennas, Radio transmitters, Data storage systems, Instrumentation, Design, Configuration, Power supplies, Thermal insulation, Flight testing, Reliability, Effectiveness.)

The design and development of the first five experimental satellites for the Transit program is discussed. The development program outlines the objectives for the first Transit satellites. Design evolution is predicted in accordance to achievement or substitution of these objectives. The sub-section on Design Evolution covers instrumentation, power supplies, configuration, antennas, despin mechanisms, thermal design, and structure. Modifications and improvements to the basic design are also presented. A detailed coverage of the requirements and changes in the doppler transmitter, power supplies, and despin mechanisms are presented. The telemeter, command, and data storage systems are explained along with structural and thermal design changes that were made in the various satellites. (Author)

AD-271 383 Div. 12
(TISTA/SEB) OTS price $8.10

Applied Physics Lab., Johns Hopkins U., Silver Spring, Md.
MAGNETIC AND GRAVITY ATTITUDE STABILIZATION OF EARTH SATELLITES,
by Robert E. Fischell. May 61, 75p. incl. illus. tables, 13 refs. (Rept. no. CM-996)
(Contract NOrd-7386)
Unclassified report

DESCRIPTORS: (Satellite vehicles, Navigation, Stabilization, *Satellite attitudes, Magnetic guidance, Gravity, Magnetic fields from Earth, Theory, Mathematical analysis.) (Solar energy for Solar cells.)

Methods by which magnetic and gravity attitude stabilization systems can be established are discussed. Ways in which attitude control can affect functioning of solar power systems and thermal balance are also discussed. (Author)

AD-271 450 Div. 12, 9
(TISTP/MFA) OTS price $1.10

Space Technology Labs., Inc., Los Angeles, Calif.
ON STABILITY OF MOTION IN THE LARGE (Ob Ustoichivosti Dvizheniya v Tselom),
by E. A. Barbashin and N. N. Krasovskii, tr. by K. N. Trirogoff. Dec 61, 7p. 2 refs. (Rept. no. 9990-6011-NU-000; STL Trans. no. 63 from Doklady Akad. Nauk SSSR, vol. 86, no. 3, pp. 453-456, 1952)
Unclassified report

DESCRIPTORS: (*Stability of *Motion.) (Curve fitting, Spheres, Satellite vehicle trajectories.) (Perturbation theory, Differential equations.) USSR.

The authors investigate stability-in-the-large of the null solution of differential equations by use of Lyapunov functions. Five theorems are advanced which state various conditions a Lyapunov function must satisfy for the null solution of the above system to be stable-in-the-large. The discussion is enhanced by two illustrative examples. (Author)

AD-271 542 Div. 12, 19
(TISTW/RD) OTS price $1.10

Aerospace Information Div., Washington, D. C.
NONGYROSCOPIC INERTIAL SYSTEMS.
29 Dec 61, 2p. (AID rept. no. 61-172; Trans. of On A Theory of Inertial Pendulum Systems. Akademiya Nauk SSSR. Izvestiya Otdeleniye Tekhnicheskikh Nauk. Energetika i Avtomatika, no. 5, pp. 163-173, 1961)
Unclassified report

DESCRIPTORS: Substitutes for Gyroscopes in *Inertial guidance, *Inertial navigation, *Guidance, *Control systems, USSR.

The conclusion is reached that the use of outer navigational information in the inertial pendulum system improves its dynamic characteristics (reduction of period, damping). Compensation conditions are established under which the vertical line is not perturbed. Possibilities of realizing compensation conditions are analyzed. The opinion is expressed that the inertial pendulum system, with proper design of inertial bodies and compensating devices, can have better characteristics in many cases than inertial inertial gyroscopic systems and can serve as a basis for the design of complex navigational systems. It can be used as a stabilizing platform. (Author)

13. INSTALLATIONS AND CONSTRUCTION

AD-270 954 Div. 13
(TISTW/PD) OTS price $10.10

Army Engineer Research and Development Labs., Fort Belvoir, Va.
CAS BUILDING,
16 Mar 53, 124p. incl. illus. tables (Rept. no. 1280)
(Proj. 8-72-03-001(PB))
(AFSWP-459) Unclassified report

DESCRIPTORS: (*Prefabricated buildings,

Military requirements, Air transportation, Construction, Lighting equipment, Heating, Lighting systems, Buildings, Roofs.)

A discussion is presented of the development and testing of an air transportable building for the complete assembly (CAS) of special weapons. The development of the CAS building was conducted from November, 1951, to March, 1953. Air transportability tests were made in the airlifts of the building from Kansas City to Eglin and from Eglin to Albuquerque. It is concluded that the CAS Building meets the military characteristics and proposed characteristics and design criteria for an Air Transportable Assembly Building (CAS building prototype) except for the following: (1) Minor details in the building and insufficient output of heaters and air conditioners all of which were corrected by changes on the drawings and in the specifications. (2) Erection time and weight limitations were not met. (Author)

AD-271 394 Div. 13, 8
(TISTE/GEL) OTS price $5.60

IMC Magnetics Corp., Westbury, Long Island, N. Y.
DEVELOPMENT OF COOLING DEVICE IN ACCORDANCE WITH BUREAU OF SHIPS CONTRACT SPECIFICATION SHIPS-8-3575 DATED 11 JAN 1960.
Final development rept. 13 June 60-31 Nov 61. 31 Nov 61, 46p. illus.
(Contract NObsr-81526)
Unclassified report

DESCRIPTORS: (Electric motors, Blowers, *Air conditioning equipment, *Cooling fans for Shipborne, Electronic equipment.) Military requirements, Specifications, Design, Tests, Dielectric properties, Radio interference, Vibration, Impact shock, Temperature, Humidity.

The dual winding motor-blower combination was successfully completed, operated from a single capacitor and gave an improvement of approximately 20% in air delivery over the original design. A similar unit operated from either 60 or 400 cycles without switching windings and delivered approximately 25% more air. In addition to the motor design, new types of centrifugal wheels were developed which show an increase in air delivery of from 5 to 30% over those commercially available. Results are detailed. Life testing and environmental testing were in an advanced stage of completion with no unfavorable results (Life is 10,000 hours or 14 months). (Author)

14. MATERIALS (NON-METALLIC)

AD-270 928 Div. 14, 9
(TISTP/FR) OTS price $12.00

Massachusetts Inst. of Tech., Cambridge.
AIR FLOW CHARACTERISTICS OF PARACHUTE FABRICS AT SIMULATED HIGH ALTITUDES.
Rept. for 1 July 58-30 June 59 on Air Force Textile Materials,
by C. V. Seshadri, G. A. Brown and others.
Mar 60, 153p. incl. illus. tables, 16 refs.
(Contract AF 33(616)5864, Proj. 7320)
(WADC TR 59-374) Unclassified report

DESCRIPTORS: (*Parachute fabrics, Parachutes, Gas flow, High altitude, Stresses, Tests, Mathematical analysis.)

The air flow characteristics of parachute canopy cloth were measured over an unusually wide range of test conditions. High altitude simulated tests (up to 150,000 feet) have shown the cloth to have markedly low flow rates, as may be predicted from a nozzle flow analogy. A method of predicting high altitude behavior was proposed. Permeabilities of four cloths were shown to be significantly dependent on their state of stress at the time of air flow measurement. The magnitude of this relationship was observed to be determined by the biaxial stress-strain behavior of each fabric. The air stream deflection tendency of thick canopy material was verified and its cause investigated. The role of pore geometry in influencing cloth permeability was explored. (Author)

AD-270 949 Div. 14, 25
(TISTM/EJH) OTS price $1.60

Material Lab., New York Naval Shipyard, Brooklyn.
THE PROTECTION AFFORDED BY WINDOW SCREENING MATERIALS AGAINST INTERNAL THERMAL RADIATION.
Final research rept.,
by L. Banet and A. Hirschman. 8 June 56, 10p. illus. tables, 6 refs. (Lab. Proj. 5046-3, pt. 95)
(AFSWP-952) Unclassified report

DESCRIPTORS: (*Thermal radiation, Radiation effects, Atomic bomb explosions, Nuclear explosions, Heat, Transmission, *Glass, Coatings, Protective coverings, *Aluminum, Sheets, *Wire screens.) (Test methods, Test equipment, Spectrophotometers, Indicator papers.)

The degree of protection offered by various window materials was investigated. Eight thermal paper indicators were selected, calibrated and evaluated after A-bomb exposure, with and without screen materials. In addition, the protection factor was determined independently by spectrophotometric means. Since results of 2 methods agree, it is possible to evaluate protection of screens by transmittance measurements.

AD-270 951 Div. 14, 25, 30
(TISTM/EJH) OTS price $3.60

Material Lab., New York Naval Shipyard, Brooklyn.
THERMAL RADIATION STUDIES.
Progress rept. no. 9, July-Dec 54,
by T. I. Monahan, L. Banet and others. 10 Mar 55, 32p. illus. 90 refs. (Lab. Projs. 5046-2, 5046-3, progress rept. no. 9)
(AFSWP-844) Unclassified report

DESCRIPTORS: (*Radiation effects, *Thermal radiation, Sources, Materials, Paints, Coatings, Textiles, Plastics, Ceramic materials, Asphalt, Fuels.) (*Skin, Simulation, Polymers, Ethylenes, Burns, Reflection.) (Test methods, Test equipment, Incandescent lamps, Tungsten.)

Thermal radiation studies consisted of: (1) development of laboratory sources of intense thermal radiation; (2) laboratory evaluations of materials; (3) effect of source and material parameters on thermal damage to materials; and (4) protective measures. A tungsten radiation source is discussed. The unit source was a 1000-w, 120-v W projection lamp with a color temperature of 3100 K. The material target was irradiated at the focus of a 36-in-diam., 9-in.

focal length paraboloidal reflector. Laboratory evaluations were made on the following: aircraft paint-on-metal systems, construction materials, liquid fuels, flight clothing, coatings, textiles, plastics, ceramics, asphalt, and skin simulant. The advantages and disadvantages of using lampblack-filled polyethylene for a skin simulant are discussed along with testing conditions. Hazards of skin burns caused by conducted heat were not reduced by treating clothing with flame retardants.

AD-270 961 Div. 14, 4, 30
(TISTM/EJH) OTS price $1.60

Plastics Lab., Princeton U., N. J.
HIGH POLYMER RESEARCH.
Quarterly status rept. no. 63, 1 Sep-30 Nov 61, by L. F. Rahm. 1 Dec 61, 13p. (Contract rept. no. 1)
(Contract DA 36-039-sc-89143, DA Proj. 3A99-15-001)

Unclassified report

DESCRIPTORS: (*Polymers, *Plastics, *Ferrocenes, *Dielectrics, *Semiconductors, Organic materials, Dielectric properties, Electrical properties, Conductivity, Synthesis, Mechanical properties, Phase studies, Viscosity, Test methods, Pressure.) (Polymerization, Ethylenes, Organic compounds, Vinyl radicals, Allyl radicals.) (Butadienes, Butenes, Propenes.)

Chemistry: Polymerization of nonconjugated multivinyl monomers is being studied. Representative monomer types, such as triallylmethane, are being synthesized for this study. Efforts toward the synthesis of improved 1,2-poly-butadiene and its use as a precurser to modified polymers continued. Dielectrics: Polyacene quinone radical polymers exhibited changes in conductivity and thermal activation energy upon application of the pressure ranges used by Bridgman for metals. There was a 100-fold change in conduction. Mechanical properties of high polymers - present and future studies are discussed on the following: phase transitions in polypropylene and polybutene-1, deformation characteristics of spherulites, failure mechanisms in glassy polymers, and flow behavior of polymer melts.

AD-271 176 Div. 14, 17, 25
(TISTM/GEC) OTS price $2.60

General Dynamics/Astronautics, San Diego, Calif.
COMPILATION OF MATERIALS RESEARCH DATA.
Summary rept. no. 1, on Phase 2, 1 Mar-1 Sep 61, by J. E. Chafey. 1 Sep 61, 20p. (Rept. no. AE 62-0060)
(Contract AF 33(616)7984)

Unclassified report

DESCRIPTORS: (*High temperature research, Niobium alloys, *Alloys, *Refractory materials, Refractory coatings.) (*Low temperature research, *Adhesives, Metals, Thermal insulation, Alloys, Stainless steel, Austenite.) (Mechanical properties, Deformation, Plasticity, Nuclear reactions, Radiation effects.) (*Plastics, *Fluorocarbons, Ceramic materials.)

Contents:
Mechanical properties of adhesives at cryogenic temperatures
High temperature properties of a Nb alloy
Elevated temperature properties of refractory metals
High temperature properties of selected alloys
Effects of nuclear radiation on metals at -423 F
High temperature coatings for refractory metals
Crack initiation and propagation at cryogenic temperatures
Study of thermal insulation materials at -423 F
Mechanical properties of non-ferrous alloys at cryogenic temperatures
Mechanical properties of cold-worked stainless steels at cryogenic temperatures
Deformation mechanisms in ductile ceramics
Elastic properties of 300 series stainless steels at cryogenic temperatures
Decomposition of austenite at cryogenic temperatures
Mechanical properties of fluorocarbon plastics

AD-271 183 Div. 14, 25
(TISTM/GEC) OTS price $5.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
HIGH-TEMPERATURE DIELECTRIC MEASUREMENTS IN THE VHF RANGE,
by B. M. Newlan. Dec 61, 47p. incl. illus. 2 refs. (Rept. no. 3-80-61-20)
(Contract NOrd-17017)

Unclassified report

DESCRIPTORS: (*Dielectrics, Dielectric properties, High temperature research, Very high frequency, Radomes, Missile windows.) (*Ceramic materials, *Aluminum compounds, *Oxides, Reinforcing materials, *Plastics, Resonance, Test methods.)

The design of a resonant-cavity, high-temperature dielectrometer operating in the VHF range was presented, together with a discussion of the measurement theory and techniques used. Experimentally determined curves of dielectric constant and loss tangent as a function of temperature were included for numerous dielectric materials that are usable at high temperatures. (Author)

AD-271 384 Div. 14, 17, 12
(TISTM/BRW) OTS price $3.50

Defense Metals Information Center, Columbus, Ohio.
COATINGS FOR THE PROTECTION OF REFRACTORY METALS FROM OXIDATION,
by C. A. Krier. 24 Nov 61, 226p. incl. illus. tables, 291 refs. (DMIC rept. no. 162)
(Contract AF 33(616)7747, Proj. 2(8-8975))

Unclassified report

DESCRIPTORS: (High temperature research, *Ceramic coatings as *Oxidation inhibitors for *Refractory materials, *Heat resistant alloys, Metals, Molybdenum, Molybdenum alloys, Niobium alloys, Tantalum alloys, Tungsten alloys, Vanadium alloys.) (Coatings of Silicides, Aluminum compounds, Oxides, Cermets, Intermetallic compounds, Metal coatings, Beryllium compounds.) (Processing by Electrodeposition, Chemical reactions, Diffusion, Flame spraying.) (Re-entry vehicles, Satellites, Spaceships, Gliders, Structures, Turbojet engines, Ramjet engines, Rocket motors, Nuclear propulsion.)

A summary is presented of the current state of the art of coatings to protect refractory metals from oxidation. Coatings for Mo are the most advanced, followed by those for Nb alloys. Significant progress was made on coatings for Ta alloys. W has received some attention, but the temperature range precludes any easy solutions.

No coatings are available for V alloys. Silicide-base coatings are of most importance for Mo and W. Both the aluminide and silicide-base coatings were of genuine value for the protection of Nb and Ta alloys. (Author)

AD-271 457 Div. 14, 17, 26
(TISTM/EJH) OTS price $1.60

Rock Island Arsenal Lab., Ill.
CONVERSION COATING FOR CHROMIUM,
by R. H. Wolff and A. C. Hanson. 4 Dec 61, 17p. incl. 11 refs. (Rept. no. 61-4360)
(Proj. 593-32-006)
Unclassified report

DESCRIPTORS: (Steel, *Chromium plating, *Chromium, Electrochemistry, Oxidation, Anodes (Electrolytic cells), *Coatings, *Metal coatings, Metal films, Chromium compounds, Oxides, Corrosion inhibition, Mechanical properties, Camouflage.) (Manufacturing methods, Solutions, Chromic acid, Sodium compounds, Hydroxides, Sulfites.)

Selected chemicals in water solution were used electrolytically in an effort to produce an oxide conversion coating upon electrodeposited chromium. Some materials and solution combinations produced thin, colored, iridescent films at the anode or cathode and sometimes at both electrodes. Cr_2O_3 films were obtained in what appears to be the hydrous form at the anode. Such films could be produced as relatively thick gels. Unfortunately, these gels have no bond to the basis Cr and upon removal from solution, dry to a loosely adherent powder. No satisfactory method was found for producing Cr_2O_3 supplementary coatings on Cr surfaces using aqueous solution techniques. (Author)

AD-271 462 Div. 14, 25
(TISTM/EJH) OTS price $1.60

Forest Products Lab., Madison, Wis.
EFFECT OF WINDOW GLASS IN PROTECTING MATERIALS FROM IGNITION BY THERMAL RADIATION.
Technical rept.,
by L. E. Downs, and H. D. Bruce. 1 Nov 55, 15p. incl. illus. tables.
(AFSWP-792)
Unclassified report

DESCRIPTORS: (*Thermal radiation, Nuclear explosions, Atomic bomb explosions, *Thermal insulation, *Glass, Combustion, Inhibition, Textiles, Paper, Materials, Test methods.)

Window glass protection of combustible materials from ignition by thermal radiation in the event of nuclear weapon explosion is discussed. The critical ignition energies of 22 materials were measured by exposure to the radiation of a graphite plate at 4200 F., with and without a filter of single strength window glass. To barely ignite a material, the energy per unit area reaching the glass had to average almost twice (average factor 1.83) the energy reaching the material directly. The protective effect varied with the test material. The protection by glass could not be calculated from the spectral emittance of the source, the spectral transmittance of the glass, and the spectral absorptance of the materials tested, without taking into consideration other properties such as the diathermancy of the materials and their change of transmittance and diathermancy during the interval of irradiation. The protective effect of glass was less against fire ball radiation than against the graphite plate radiation. (Author)

AD-271 589 Div. 14, 30
(TISTM/GEC) OTS price $5.60

National Carbon Co., Inc., Cleveland, Ohio.
RESEARCH AND DEVELOPMENT ON ADVANCED GRAPHITE MATERIALS. VOLUME IV. ADAPTATION OF RADIOGRAPHIC PRINCIPLES TO THE QUALITY CONTROL OF GRAPHITE.
Rept. for Apr 58-Oct 60, on Refractory Inorganic Nonmetallic Materials,
by R. W. Wallouch. Oct 61, 45p. incl. illus.
(Contract AF 33(616)6915, Proj. nos. 7350, 7381, and 7-817)
(WADD TR 61-72, Vol. 4) Unclassified report

DESCRIPTORS: (*Graphite, *X rays, *Radiography, Sensitivity, Chemical impurities, Distribution.) (X rays, Detectors, Fluorescent screens, Photographic film, Ionization chambers, Sheets, Aluminum, Selenium, Coatings.)

Special equipment and techniques were developed for the radiographic inspection of large size graphite shapes, as well as for complex multithickness shapes. Because of the low atomic number of the element C, techniques were used which discriminated between the transmitted and scattered radiation. Various methods are described which have been used for nondestructively testing graphite and exposure charts relaying exposure time to graphite thickness for various source voltages were prepared. (Author)

AD-271 599 Div. 14, 7
(TISTP/FR) OTS price $6.60

Spectrolab, Inc., North Hollywood, Calif.
INVESTIGATION OF OPTICAL COATINGS FOR SOLAR CELLS.
Semi-annual rept. no. 1, 25 Jan-30 June 60,
by A. E. Mann. 30 June 60, 67p. incl. illus.
(Contract DA 36-039-sc-85284)
Unclassified report

DESCRIPTORS: (*Solar cells, *Optical coatings, Protective coverings, Optical filters, Tests, Glass.) (Power supplies, Solar energy, Semiconductors.)

The use of spectrally selective coatings as filters for silicon solar cells was studied. The thermal balance of a solar panel in space and the resultant effect on array efficiency was examined; a specific example is studied. The physical properties and environmental characteristics of state-of-the-art coatings were studied. Measurements of the spectral transmittance, reflectance and emittance for coated cells were obtained. Environmental tests included humidity, high and low temperature storage, temperature shock, vacuum storage, and ultraviolet and beta irradiation. (Author)

15. MATHEMATICS

AD-270 959 Div. 15
(TISTP/GRW) OTS price $3.60

Operations Analysis Office, Air Force, Washington, D. C.
THE APPLICATION OF STATISTICAL DECISION THEORY TO A MISSILE TESTING PROBLEM,
by Walter L. Deemer and John P. Mayberry.
Dec 61, 39p. incl. illus. tables, 7 refs.
(Operations analysis paper no. 5)
Unclassified report

DESCRIPTORS: (*Operations research, Guided missile research, *Statistical analysis, Theory.) (Guided missiles, Research program administration.)

Division 15 - MATHEMATICS

AD-271 038 Div. 15
(TISTP/TL) OTS price $4.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
ON LINEAR EXTENSIONS OF THE CANONICAL PARTIAL ORDER IN THE n-CUBE Q TO THE Nth POWER.
Technical rept. on Mathematics,
by Sze-Tsen Hu. Oct 61, 45p. incl. tables.
(Rept. no. 6-90-61-113)
Unclassified report

DESCRIPTORS: (*Functions, *Mathematical logic, Lattices, *Linear systems, Number theory, Inequalities, Real variables, Complex variables, Algebra.)

The enumeration of the canonical truth functions is considered. A method of getting all of the canonical truth functions is given. The canonical partial order is studied in the Q to the Nth power and proven that Q to the Nth power becomes a lattice with respect to the canonical partial order. A recurrent method of constructing the lattice structure of Q to the Nth power is also given. The fact is established that the canonical partial order in Q to the Nth power can be extended to a linear order which will be called the principal linear order of Q to the Nth power. Since this linear order of Q to the Nth power can be defined by an injective canonical weight function, those linear orders of Q to the Nth power which can be defined by injective weight functions can be studied. A recurrent method of finding these linear orders of Q to the Nth power is given. These linear orders are applied to the problem of finding all canonical truth functions. (Author)

AD-271 136 Div. 15
(TISTP/GRW) OTS price $1.60

Institute for Fluid Dynamics and Applied Mathematics, U. of Maryland, College Park.
A NECESSARY AND SUFFICIENT CONDITION IN THE MAXIMUM-MINIMUM THEORY OF EIGENVALUES,
by Alexander Weinstein. Jan 62, 14p. 16 refs.
(Technical note no. BN-276)
(Contract AF 49(638)228, Proj. 17501)
(AFOSR-2061) Unclassified report

DESCRIPTORS: (*Integral equations, *Matrix algebra, Inequalities, Partial differential equations.)

A necessary and sufficient condition of the Sturm type is given for the equality in the maximum-minimum theory of eigenvalues. Up to now only a sufficient condition was known. The method of intermediate problems is used. (Author)

AD-271 433 Div. 15
(TISTP/TL) OTS price $3.60

Institute of Field Physics, U. of North Carolina, Chapel Hill.
QUANTIZATION OF FIELDS WITH INFINITE-DIMENSIONAL INVARIANCE GROUPS. II. ANTICOMMUTING FIELDS,
by Bryce S. DeWitt. Nov 61, 35p. (Publication no. 12)
(Contract Nonr-85507; Grant no. AFOSR 61-72)
(AFOSR-2165) Unclassified report

DESCRIPTORS: (Green's function, *Algebraic topology, Quantum mechanics, *Groups (Mathematics), Differential equations.) (Numerical analysis, Transformations (Mathematics), Matrix algebra, Vector analysis, Integral equations, Commutators.)

The Green's function approach to the definition of commutators for fields possessing infinite dimensional invariance groups is extended to the case of anticommuting fields. The discussion is restricted to fields which provide linear homogeneous or inhomogeneous representations of the group, a restriction which excludes no case of practical interest and facilitates setting up the formalism in a manifestly covariant way. Self-consistency of supplementary conditions, Huygens' principle and reciprocity relations are established just as for commuting fields. Careful attention must be paid to the ordering of anticommuting factors, particularly in the demonstration of the Poisson-Jacobi identity. The invariance properties of the Poisson bracket are investigated in detail and the notion of conditional invariant is introduced. A special class of conditional invariants called asymptotic invariants, which give a complete physical characterization of initial and final states of the dynamical system, is studied. (Author)

AD-271 449 Div. 15
(TISTP/GRW) OTS price $1.10

Space Technology Labs., Inc., Los Angeles, Calif.
GENERALIZED RANDOM PROCESSES (Obobshchennye Sluchainye Protsessy),
by I. M. Gel-fand, tr. by Z. Jakubski. Nov 61, 7p. 11 refs. (Rept. no. STL-TR-61-5110-62; Trans. from Doklady Akad. Nauk, SSSR, vol. 100, no. 5, pp. 853-856, 1955)
Unclassified report

DESCRIPTORS: (Statistical distributions, *Statistical processes, Statistical functions, Probability.)

AD-271 516 Div. 15
(TISTP/TL) OTS price $1.60

Brown U. Div. of Applied Mathematics, Providence, R. I.
ZERO CROSSING PROBABILITIES FOR GAUSSIAN STATIONARY PROCESSES,
by G. F. Newell and M. Rosenblatt. Jan 62, 14p. 9 refs. (Technical rept. no. 5)
(Contract Nonr-56229, Proj. NR-042-217)
Unclassified report

DESCRIPTORS: (*Probability, Statistical processes, Theory.) (Inequalities, *Statistical analysis, Statistical functions, *Statistical distributions, Series, Sequences, Integral equations, Matrix algebra, Differential equations, Functions, Special functions, Harmonic analysis.)

16. MEDICAL SCIENCES

AD-270 920 Div. 16
(TISTB/CCH) OTS price $4.60

Biological Labs., Frederick, Md.
BIBLIOGRAPHY ON HISTOPLASMOSIS SUPPLEMENT, 1955-1960.
Sep 61, 44p.
Unclassified report

DESCRIPTORS: (*Bibliography, *Fungus infections.) (Diagnosis, Culture media, Immunization, Chemotherapeutic agents, Disease carriers, Experimental data.)

AD-270 948 Div. 16, 14, 30
(TISTM/EJH) OTS price $1.10

Material Lab., New York Naval Shipyard, Brooklyn.
THE INFLUENCE OF AIR SUPPLY AND AIR FLOW ON BURNS BEHIND IRRADIATED FABRICS.
Final research rept.,
by Willard L. Derksen and John J. Bates.
29 June 56, 9p. incl. tables, 2 refs. (Lab. Proj. 5046-3, pt. 100)
(AFSWP-1000) Unclassified report

DESCRIPTORS: (*Thermal radiation, Gas flow, Air, *Skin, *Burns, Protective clothing, Clothing, *Cotton textiles, Heat transfer, Radiation effects.) (Test methods, Test equipment, Carbon arc lamps, Skin, Simulation, Plastics.)

The influence of air flow on burns under a fabric exposed to intense thermal radiation was studied. It was determined that both ignition of cloth and the heat transferred to a backing are affected by air supply, air movement or wind. The effects are as high as a factor of 2 for air supplies or movements normally encountered. Mounts for fabrics or objects near the irradiated cloth may appreciably influence air supply or movement. The effect of air supply or flow on cloth combustion is anomalous; little or no air will smother a flame or glow, normal drafts or wind will remove volatile products, cool the fabric and thereby inhibit ignition. A slight air movement of approximately 1 fps provides optimum oxygen, minimal cooling and minimum energy for ignition. Flash burns behind clothing often result when there is no cloth ignition, especially when there is no separation between cloth and backing; for this situation the effect of air flow is also appreciable. (Author)

AD-270 970 Div. 16, 20
(TISTB/CCH) OTS price $8.60

Baylor U. Coll. of Medicine, Houston, Tex.
A STUDY OF THE EFFECTS OF TOTAL AND PARTIAL BODY RADIATION ON IRON METABOLISM AND HEMATOPOIESIS.
Progress rept., 1 Sep 55-31 Jan 56,
by Vincent P. Collins, R. Kenneth Loeffler and others. 31 Jan 56, 1v. incl. illus. tables, refs.
(Contract DA 49-007-md-428)
(AFSWP 809) Unclassified report

DESCRIPTORS: (*Radiation effects, *Metabolism, *Iron and *Hemopoiesis.) (*Cancer, Cells (Biology), Blood, Biochemical tests, Enzymes, Detection, Therapy.)

This report includes:
METHOD FOR DETERMINING THE IRON-BINDING CAPACITY OF SERUM, by C. Richard Tinguely. 1956.

RADIOIRON TRACER STUDIES FOR THE EVALUATION OF RADIATION DAMAGE, 1956, 12p.

INVESTIGATIONS OF ENZYMIC X-RAY DOSIMETERS IN RED BLOOD CELLS, by D. A. Rappoport and V. P. Collins. 1956.

EFFECTS OF TOTAL BODY RADIATION ON IRON TURNOVER PLATELET COUNT AND WHITE CELL COUNT, 1956.

AD-271 031 Div. 16, 28
(TISTB/MS) OTS price $9.10

Harvard U. Div. of Engineering and Applied Physics, Cambridge, Mass.
ACOUSTIC ORIENTATION OF PREY BY THE BARN OWL, Tyto alba,
by Roger Payne. 10 Nov 61, 67p. illus. 20 refs.
(Technical rept. no. 1)
(Contracts DA 19-129-qm-1428 and Nonr-322500, Projs. 7-99-01-001 and NR 301-549)
Unclassified report

DESCRIPTORS: (Birds, *Bird navigation, Psychoacoustics, Hearing, Sound, Measurement, Position finding, Theory.) (*Ear, Anatomy, Sensitivity to Frequency.)

Barn owls (Tyto alba) can locate prey in total darkness using hearing alone, with an accuracy of about one degree in both the vertical and horizontal planes. Differences between the behavior of barn owls flying at prey in complete darkness (analyzed from films taken under infrared illumination) and their behavior in the light are correlated with the problems they must face in acoustical orientation. Experiments with owls trained to strike a concealed loudspeaker show that they depend on frequencies of sound above 9,000 cps. At such frequencies, regions of high and low sensitivity are directed along different paths for the two ears. These are correlated with the asymmetry of the barn owl's external ears. Movements of a flap of skin in front of the ear opening change the over-all pattern of sensitivity by redirecting the regions of maximum and minimum sensitivity. A theory is presented to explain how a barn owl might localize the position of a sound source by moving its head until the intensity of all frequencies comprising a complex sound is maximal in both ears. When it hears this maximum frequency spectrum, with both ears, it will automatically be facing the sound. (Author)

AD-271 086 Div. 16
(TISTB/CCH) OTS price $1.10

Dental Research Facility, Naval Training Center, Great Lakes, Ill.
INFRARED SPECTROSCOPIC STUDIES ON HUMAN SALIVA. I. ORIGIN OF A COMPONENT OF HUMAN SALIVA EXHIBITING AN INFRARED ABSORBANCE MAXIMUM AT 12 MICRONS,
by Thomas S. Meyer, Burton L. Lamberts, and Maurice A. Mazzarella. Dec 61, 3p. illus. 5 refs.
(Proj. MR005.12-5004.8)
Unclassified report

Presented before the 39th General Meeting of the International Association of Dental Research, held in Boston, Massachusetts on March 23-26, 1961.

DESCRIPTORS: (*Saliva, *Infrared spectroscopy, Man, Absorption, Measurement, Immunization.) (*Dental plaques, *Dental caries, Chemical analysis.)

The salivary component which produces the absorption peak at 12 microns in the infrared spectrum appeared to be a product of the salivary glands. This factor was found in parotid and submaxillary saliva of both caries-immune and caries-susceptible individuals. The component disappeared in the whole saliva of certain caries-susceptible individuals and was not demonstrable in dental plaque, either of caries-immune or caries-susceptible subjects. (Author)

AD-271 087 Div. 16
(TISTB/CCH) OTS price $1.10

Dental Research Facility, Naval Training Center, Great Lakes, Ill.
INFRARED SPECTROSCOPIC STUDIES ON HUMAN SALIVA. II. IDENTIFICATION OF A COMPONENT OF HUMAN SALIVA EXHIBITING AN INFRARED ABSORBANCE MAXIMUM AT 12 MICRONS,
by Thomas S. Meyer and Burton L. Lamberts.
Dec 61, 4p. illus. 7 refs.
(Proj. MR005.12-5004.8)
Unclassified report

DESCRIPTORS: (*Saliva, *Infrared spectroscopy, Man, Detection, Chemical properties, Absorption.) (*Bicarbonates, Biochemical tests.)

Experiments were designed to identify the component in saliva which gave an infrared absorbance maximum at 12 microns. This factor was found to be dialyzable, water soluble, and essentially insoluble in ether and benzene. It showed characteristics of an inorganic base. On the basis of its chemical properties and infrared spectrum, the component was identified as bicarbonate. The relation of the infrared characteristics of various salivary fluids to their bicarbonate content is discussed. (Author)

AD-271 160 Div. 16
(TISTB/MS) OTS price $3.60

Texas U. Medical Branch, Galveston.
THE ELECTROCARDIOGRAM OF THE YOUNG CHIMPANZEE.
Rept. on Physiological Base-Line Studies of Zoological Specimens,
by A. M. Weissler, J. Fineg and J. V. Warren.
Dec 61, 27p. incl. illus. tables, 13 refs.
(Rept. no. MDC-TDR-61-29)
(Contract AF 29(600)2487)
Unclassified report

DESCRIPTORS: (*Primates, *Electrocardiography, Physiology, Test methods.)

Routine standard and precordial lead electrocardiograms were obtained on 36 chimpanzees in the range from 1 to 10 years. Analysis of the tracings relative to the duration of the electrocardiographic intervals, the amplitude of the waves, the mean electrical axes and cardiac rhythm was performed. The relationships of these electrocardiographic data to age, body weight and heart rate were studied and a comparison of these observations with children of comparable age and body weight was performed. Similar age and heart rate relationships in the electrocardiographic intervals of the human and chimpanzee were noted. Of particular interest were the findings of a lower amplitude and duration of the ventricular depolarization process (QRS) in the chimpanzee and a marked difference in the projection of the T waves. These observations on the electrocardiogram of the chimpanzee demonstrate the feasibility of obtaining and analysing the electrocardiogram in this animal and the applicability of the information derived to the understanding of the human electrocardiogram. (Author)

AD-271 403 Div. 16
(TISTB/AW) OTS price $1.60

Material Lab., New York Naval Shipyard, Brooklyn.
THE LIGHT COAGULATOR AS A SOURCE FOR RETINAL BURN STUDIES.
Final rept.,
by J. A. Carter. 18 May 61, 10p. illus. tables, 4 refs. (Lab. proj. no. 5046, pt. 14)
(DASA-1239) Unclassified report

DESCRIPTORS: (Ophthalmology, *Optical instruments, Retinoscopes.) (Laboratory equipment, Radiation injuries, Burns, *Retina.)

The purpose of this investigation was to determine the retinal irradiance and retinal image size obtainable when rabbit and human eyes are exposed to the Zeiss light coagulator and to determine the feasibility of this laboratory source for research on retinal burns. The maximum retinal irradiance with the Zeiss light coagulator is 120 cal/sq cm sec and 41 cal/sq cm sec on the fundus of rabbit and human eyes with maximum image diameters of 1.00 and 1.70 mm, respectively; these values were calculated from experimental data using a lens substitution method. (Author)

AD-271 441 Div. 16, 28
(TISTB/AW) OTS price $2.60

Hazelton Labs., Inc., Falls Church, Va.
ESTABLISHMENT AND MAINTENANCE OF A COLONY OF LABORATORY CONDITIONED RHESUS MONKEYS.
Annual progress rept., May-Dec 61,
by O. E. Paynter. 9 Feb 62, 7p. incl. tables.
(Contract DA 49-193-md-2151)
Unclassified report

DESCRIPTORS: (*Veterinary medicine, *Laboratory animals, Primates, Animal industry.) (Medical laboratories, Operation, Maintenance, Housing, Ecology, Survival.)

A supply of conditioned Macaca (rhesus) mulatta monkeys for use in behavioral studies are to be between six and eight pounds, have a common environmental history, and be free of disease. Details of procurement, housing, quarantine, and conditioning procedures are presented. (Author)

AD-271 443 Div. 16
(TISTB/CCH) OTS price $1.60

Naval Medical Research Lab., New London, Conn.
THE MEASUREMENT OF DEXTROSE IN STANDARD SOLUTIONS WITH DREYWOOD'S ANTHRONE REAGENT AND THE KLETT-SUMMERSON PHOTOELECTRIC COLORIMETER (A STATISTICAL EVALUATION AND A SIMPLE MICROPROCEDURE),
by Kempton G. Wing, John J. O'Hare, and Charles E. Dorsey. 10 Apr 58, 12p. incl. illus. tables, 9 refs. (Rept. no. 294; Vol. 17, no. 1)
(Proj. NM 24 01 20.02.01)
Unclassified report

DESCRIPTORS: (*Glucose, *Anthrones, Reagents, *Colorimetry, Photoelectric cells, Measurement.) *Body fluids.

An experiment was performed using a macro-procedure for the anthrone-hexose reaction with standard solutions of dextrose and a Klett-Summerson photoelectric colorimeter to reveal significant sources of error and variability and to assess the upper limits of accuracy of this reaction with reference to its suitability for the clinical laboratory and other places where precision may be required. Sensitivity and accuracy were found sufficient to permit the introduction of additional errors arising from the use of biological fluids without necessarily removing the anthrone-method from a position of advantage in competition with other procedures. Slow fading of the anthrone-carbohydrate complex occurred after 8 hours at 24 C but this fading was undetectable if specimens were read as soon as they cooled. When special reaction tubes designed to conserve heat were used in a warm room, the anthrone-hexose reaction obeyed the Bouguer-Beer law for dextrose in quantities of 3.75 to 20 gamma in 0.75 ml. of original solution. Two supplementary methods of controlling temperature to obtain satisfactory color development are considered, and the effects of their improper use are pointed out. A simple procedure is proposed for using Dreywood's anthrone reagent to measure sugar in 20 cu. mm. of blood collected in a Sahli pipette. (Author)

AD-271 474 Div. 16, 20
(TISTB/LH) OTS price $1.25

Western Biological Labs., Culver City, Calif.
CHRONIC EFFECTS OF CONTINUOUS LOW-LEVEL GAMMA RADIATION UPON B VITAMIN REQUIREMENTS.
Rept. for 16 Apr 60-15 June 61 on Space Biology Research,
by B. H. Ershoff and T. M. Graham. Oct 61, 39p. incl. tables.
(Contract AF 33(616)7090, Proj. 7164)
(ASD TR 61-534) Unclassified report

DESCRIPTORS: (*Radiation effects, *Gamma rays, Nutrition, *Vitamin B.) (Laboratory animals, Growth, Learning, Survival.)

Immature male rats were fed a highly purified diet containing low, medium and high doses of the B vitamins. A fourth group was fed a natural food stock ration. Animals were exposed for periods up to 17 weeks to gamma irradiation from a Cesium-137/Barium-137 source at levels of 0, 3, 30, 300, and 500 r per week. Average length of survival at the 500 r per week level was significantly longer for rats fed the stock ration than for rats fed the purified diets. No significant difference in growth increment, appearance, organ weights or length of survival attributable to differences in B vitamin content were observed among the various groups. General animal activity measured by an open field test decreased with exposure to radiation up to 8 weeks duration while changes in learning ability were noted after 17 weeks. The composition of the diet employed was without significant effect on activity or learning performance on either irradiated or nonirradiated rats. (Author)

AD-271 514 Div. 16
(TISTB/CCH) OTS price $1.60

Aerospace Information Div., Washington, D. C.
SOVIET LITERATURE ON LIFE SUPPORT SYSTEMS.
Monthly rept. no. 7, Oct-Nov 61.
20 Dec 61, 13p. incl. illus. tables, 5 refs.
(AID rept. no. 61-168)
Unclassified report

DESCRIPTORS: (*Literature, *USSR, *Space medicine, *Space flight, Biology, Radiobiology, Survival, Hyperthermia, Blood.)

AD-271 554 Div. 16
(TISTB/MS) OTS price $10.50

Health Research, Inc., Buffalo, N. Y.
STUDIES ON RESUSCITATION AND ARTIFICIAL RESPIRATION.
Progress rept., 1 Nov 60-31 Dec 61,
by James O. Elam and John L. Evers. 31 Dec 61, 131p. incl. illus. tables.
(Contract DA 49-007-md-507)
Unclassified report

DESCRIPTORS: (*Respirators, *Artificial respiration, Simulation, Test equipment, Design.) (*Anoxia, Anesthesia, Respiration, Training, Training devices.)

Contents:
A new manual bag inflator
Lung model for evaluation of ventilatory devices
Portable heart-lung oxygen resuscitator
Design and evaluation of a time-limited assistor-controller for conscious and unconscious apneic patients
Comparative tests of assistor ventilators
Electromyography during surgical anesthesia
Preliminary evaluation of the MEDL resuscitator
Evaluation of Nasopharyngeal tubes
Treatment of protracted surgical hypotension with sodium bicarbonate
CO(2) elimination at low flows without soda lime
Anatomical dynamics of the upper airway
Training medical and lay personnel in heart-lung resuscitation

AD-271 578 Div. 16
(TISTB/CCH) OTS price $1.60

Queen Mary Coll., U. of London (Gt. Brit.).
THE EFFECT OF CARBON DIOXIDE CONCENTRATION, LIGHT INTENSITY AND ISONICOTINYL HYDRAZIDE ON THE PHOTOSYNTHETIC PRODUCTION OF GLYCOLLIC ACID BY CHLORELLA,
by G. G. Pritchard, Wendy J. Griffin, and C. P. Whittingham. 14 Nov 61, 13p. incl. illus. 12 refs. (Technical note no. 2)
(Contract AF 61(052)245)
(AFOSR-2024) Unclassified report

DESCRIPTORS: (*Algae, *Glycolic acids, Photosynthesis, Production.) (Carbon dioxide, Light, Intensity, Isoniazid.) Colorimetric analysis.

Glycollic acid production by Chlorella was measured by colorimetric determination of the acid excreted into the medium. Glycollic acid production was at a maximum at a low concentration of carbon dioxide but it tended toward zero as the rate of photosynthesis approached carbon dioxide saturation. The production of the acid became measurable at light intensities approaching that required to saturate photosynthesis and increased steadily with further increase in intensity. Treatment with isonicotinyl hydrazide resulted in an approximately three-fold stimulation of glycollic acid concentration over the range of conditions used. It is suggested that the precursor of glycollic acid is ribulose diphosphate, and that isonicotinyl hydrazide acts by inhibiting the further metabolism of glycollic acid. (Author)

AD-271 593 Div. 16
(TISTB/CCH) OTS price $1.60

Aerospace Medical Div., Wright Air Development Div., Wright-Patterson Air Force Base, Ohio.
HISTOPATHOLOGICAL STUDIES OF TISSUE REACTIONS TO VARIOUS METALS IMPLANTED IN CAT BRAINS.
Rept. on Acoustic Energy Control,
by Farrel R. Robinson and Marion T. Johnson.
Oct 61, 13p. incl. illus. 15 refs.
(Proj. 7231)
(ASD TR 61-397) Unclassified report

DESCRIPTORS: (*Brain, *Tissues (Biology), *Metals, *Transplantation, Histological sections, Pathology, Laboratory animals.) Radiographic analysis.

Metal rods of gold, platinum, silver, stainless steel, tantalum, and tungsten were implanted in cat brain tissue. The resulting changes were observed for as long as 6 months. The stainless steel and gold rods caused the least reaction while platinum and tantalum caused a slightly greater response. The lesions resulting from tungsten were comparatively more extensive. Silver elicited a violent tissue response with the astrocytic reaction extending to 3.75 mm in diameter in a lesion produced by a 7-day implantation. This evidence indicates a preference of metals to be used in the fabrication of intracerebral electrodes from the standpoint of tissue reaction. (Author)

17. METALLURGY

AD-270 900 Div. 17
(TISIP/KMG) OTS price $1.00

Armed Services Technical Information Agency, Arlington, Va.
EXPLOSIVE FORMING. AN ASTIA REPORT BIBLIOGRAPHY,
comp. by Katye M. Gibbs. 15 Feb 62, 341 refs.
Unclassified report

DESCRIPTORS: (Alloys, Aluminum alloys, Hafnium alloys, Heat resistant alloys, Metal plates, Metals, Molybdenum alloys, Niobium alloys, Powder alloys, Refractory materials, Rhenium alloys, Sheets, Stainless steel, Steel, Tantalum alloys, Titanium alloys, Tungsten alloys.) (Vanadium alloys, Zirconium alloys.) (Manufacturing methods, Metal forming presses, Welding, Extrusion.) (Explosives, Shock waves, Energy, Transmission, Water, Oils.) (Airframes, Cylindrical bodies, Spheres, Structural shells, Hemispherical shells.) *Explosive forming, *Bibliography, *Metallurgy, Hardening, USSR, Great Britain.

This bibliography was prepared by ASTIA, in response to numerous inquiries concerning the use and application of explosive energy in metal working processes. Reports available from ASTIA are identified as ASTIA documents and were selected from both the ATI and AD collections covering the periods from 1942 through 1952 and from 1953 to the present. Within each of these categories, military reports are arranged alphabetically by source and title; reports prepared by Department of Defense contractors are listed alphabetically by source, contract, and then by date. Citations to open literature, commercial papers and patents also appear alphabetically by author or title within separate categories.

AD-270 904 Div. 17, 25
(TISTM/EJH) OTS price $2.60

Illinois U., Urbana.
THE MARTENSITIC TRANSFORMATION IN Fe-31 wt-%Ni,
by J. F. Breedis and C. M. Wayman. 1961, 17p.
illus. 29 refs.
(Contract AF 49(638)420)
(AFOSR-1979) Unclassified report

DESCRIPTORS: (*Iron alloys, Nickel alloys, *Austenite, *Martensite, *Phase transitions, Phase studies, Microstructure, Crystal structure, Lattices, Transition temperature, X-ray diffraction analysis.) Alloys.

The crystallography of the martensitic transformation in the Fe-30 Ni alloy was reinvestigated. The scatter in the habit plane as determined from measurements on the mid-rib plane was smaller than reported previously, and the orientation relationship was determined from a martensite plate having known direction cosines. From agreement with crystallographic theory and from observations of the morphology of the martensite plates, it is suggested that the mid-rib plane represents the starting region of the transformation. (Author)

AD-270 955 Div. 17, 26
(TISTM/BRW) OTS price $11.00

Wah Chang Corp., Albany, Oreg.
TANTALUM ALLOY INGOT RELIABILITY AND SHEET ROLLING DEVELOPMENT PROGRAM. A STATE-OF-THE-ART SURVEY.
Quarterly progress rept. no. 1, 20 July-31 Nov 61,
by D. J. Maykuth, A. G. Imgram and H. R. Ogden.
31 Nov 61, 1v. incl. illus. tables.
(Contract AF 33(657)7015, Proj. 7-826; In cooperation with Battelle Memorial Inst., Columbus, Ohio.)
Unclassified report

DESCRIPTORS: (*Heat resistant alloys, *Tantalum alloys, Niobium alloys, Vanadium alloys, Tungsten alloys, *Sheets, Rolling mills, Reliability, Production, Manufacturing methods, Powder metallurgy, Melting, Processing, Extrusion, Forging.) (Physical properties, Phase transitions, Transition temperature, Stresses, Rupture, Heat treatment, Deformation, Tensile properties, Welding, Oxidation, Machining.) Airframes, Guided missiles, Spaceships.

A state-of-the-art survey of techniques and practices used in the production of Ta sheet alloys is presented. The current experiences in producing Ta alloy sheet and the available physical and mechanical property data were reviewed in the light of the anticipated applications for these materials by the Air Force. The recommendation was made that the choice of the alloy selected for the succeeding phases of this contract be limited to the Ta-30Nb-7.5V or the Ta-10W composition. (Author)

AD-270 976 Div. 17, 26, 1
(TISTM/BRW) OTS price $8.10

Republic Aviation Corp., Farmingdale, N. Y.
IMPROVED METHODS FOR THE PRODUCTION OF TITANIUM ALLOY EXTRUSIONS.
Interim technical engineering rept. no. 19,
1 Oct 61-1 Jan 62,
by Murray H. Levine. Jan 62, 80p. incl. illus.
(Contract AF 33(600)34098, Proj. 7-556)
(ASD TR 7-556, vol. 19)
Unclassified report

DESCRIPTORS: (Airframes, Materials, *Titanium alloys, Aluminum alloys, Molybdenum alloys, *Extrusion, Manufacturing methods, Processing, Dies, Ceramic coatings, Glass, Lubrication, Metal forming presses.) (Coatings, Oxygen, Chemical reactions, Contamination on Heat treatment.) (Mechanical properties, Tensile properties, Surface properties, Hardness, Microstructure.)

Development of techniques for extruding thin cross section tee shapes of 7Al-4Mo Ti alloy were demonstrated. Ten 20-ft lengths of nominal 0.092 x 2.00 x 1.75 in. and two 16-ft lengths of nominal 0.062 x 2.00 x 1.75 in. structural tees were extruded. The extrusion pressures ranged from 113,000 to 142,000 psi. Alumina material flame sprayed on the die surface prevented wear, wash and hot deformation of the die material, resulting in a smoother surface extrusion with uniform cross section dimensions throughout the length. Micro-examination indicated that shorter billet heat soak times (60 min) reduced oxygen stabilized alpha Ti contamination of the extruded product. Five glass compositions, based on the E-71 glass formula, covering a wide viscosity range at the 1800 F extrusion temperature were prepared, that will permit the selection of compatible, relatively inert glasses to be used for the various extrusion functions. (Author)

AD-270 977 Div. 17, 25
(TISTM/BRW) OTS price $1.10

Electro-Optical Systems, Inc., Pasadena, Calif.
INVESTIGATION OF THE EFFECT OF ULTRA-RAPID QUENCHING ON METALLIC SYSTEMS, INCLUDING BERYLLIUM ALLOYS.
Monthly progress rept. no. 6, for Aug 61, by C. B. Jordan. 15 Sep 61, 3p. (EOS rept. no. 1650-M-6)
(Contract AF 33(616)8011, Proj. 1(8-7351)
Unclassified report

DESCRIPTORS: (Alloys, *Beryllium alloys, Aluminum alloys, Copper alloys, Silicon alloys, Nickel alloys, Phase studies, Cooling, X-ray diffraction analysis.) (Phase transitions, Microstructure, Lattices.)

In the Be-Ni system, further work was performed on alloys of the composition 5.7, 40, and 58 wt-% Be. After melting, the 5.7 wt-% Be sample was found to consist of a mixture of BeNi and Ni; this constitution was unchanged by rapid quenching. The alloy of 40 wt-% Be had previously been found to consist of Be21Ni5 after preparation by melting, but to change to BeNi after rapid quenching. The 58 wt-% Be alloy consisted of a mixture of Be21Ni5 and Be. After rapid quenching, the X-ray pattern shows a completely new phase, tentatively analyzed as having a fcc lattice with a parameter of 4.05 angstroms. In the Be-Al system, samples of 1 and 5 wt-% showed only the pattern of Al both before and after quenching. The 80 wt-% Be alloy was a mixture of Be and Al, with no measurable change in parameters. (Author)

AD-271 030 Div. 17, 26
(TISTM/BRW) OTS price $1.50

Defense Metals Information Center, Columbus, Ohio.
NOTES ON THE FORGING OF REFRACTORY METALS, by H. J. Henning and F. W. Boulger. 21 Dec 61, 47p. incl. illus. tables, 35 refs. (DMIC memo. no. 143)
Unclassified report

DESCRIPTORS: (*Refractory materials, *Forging, Molybdenum, Molybdenum alloys, Tungsten, Tungsten alloys, Tantalum, Tantalum alloys, Niobium, Niobium alloys.) Preparation, Powder metallurgy, Metal forming presses, Forge presses, Heating, Dies, Lubricants, Design, Mechanical properties.

The forging of Mo, W, Nb, Ta, and their alloys is discussed. Information is provided about forging practices and on the availability of forgings. The information was obtained from publications and from a survey of alloy producers, forging companies, and consumers. The Aerospace Industries Association cooperated with the Defense Metals Information Center in this survey by sending questionnaires to an appropriate segment of its membership. (Author)

AD-271 081 Div. 17, 27
(TISTM/BRW) OTS price $1.60

Aerojet-General Corp., Azusa, Calif.
INVESTIGATION OF STRESS-CORROSION CRACKING OF HIGH-STRENGTH ALLOYS.
Quarterly progress rept. no. 5, 1 Oct-31 Dec 61, by R. J. Uzdarwin. 26 Jan 62, 5p. illus. tables. (Rept. no. 0414-01-5)
(Contract DA 04-495-ORD-3069)
Unclassified report

DESCRIPTORS: (*Heat resistant alloys, Steel, Stainless steel, Titanium alloys, Vanadium alloys, Chromium alloys, *Corrosion, *Stresses, Fracture (Mechanics), Failure (Mechanics).) (Rocket cases, Materials, Corrosion inhibition, *Corrosion research, Corrosive liquids, Corrosive gases.) Alloys.

Bent-beam specimens selected from the high-strength groups of each of the alloys have accumulated over 21 weeks of exposure time in the environments of distilled and tap water. Some failures were observed with alloy specimens that were exposed to distilled water. U-bend specimens have undergone over 28 weeks of testing, and significant failures were noted in several of the environments. Selected bent-beam specimens, coated with solid propellant, have undergone 3 weeks of exposure without failure. A high-temperature high-humidity environment produced the most rapid stress-corrosion failures. Of the room-temperature environments, distilled water was found to produce the most rapid failures. (Author)

AD-271 123 Div. 17, 25
(TISTM/EJH) OTS price $5.60

Rutgers U. Coll. of Engineering, New Brunswick, N. J.
RECRYSTALLIZATION AND GRAIN GROWTH OF ALUMINUM, by S. Weissmann, T. Imura, and N. Hosokawa. Feb 62. 51p. incl. illus. 20 refs. (Technical rept. no. 11)
(Contract Nonr-40409)
Unclassified report

DESCRIPTORS: (*Aluminum, *Crystals, Grains (Metallurgy), *Crystallization, Growth, Deformation, Lattices, Microstructure, Electron microscopy, X-ray diffraction analysis.) Metals.

The dislocation structure of cold-worked high-purity Al and the growth processes in recrystallization were studied by transmission electron microscopy and x-ray diffraction techniques.

The dislocation structure of the asymmetrical low-angle boundaries is held responsible for the existence of a long-range stress field and the interconnection between mechanical and thermal stability of these boundaries is shown and related to the recrystallization mechanism. As grain growth proceeds the dislocation density decreases constantly, while the lattice misorientation within the grain increases. It is shown that this increase of misorientation is associated with defects incurred during the growth process and is not due to survivals of defects introduced during the deformation process. (Author)

AD-271 128 Div. 17
(TISTM/BRW) OTS price $3.60

Virginia Inst. for Scientific Research, Richmond.
THE ACCELERATED CORROSION OF METALS.
Quarterly rept. no. 9, 16 Sep-15 Dec 61,
by Henry Leidheiser, Jr., and David A. Jackson, Jr. 22 Jan 62, 28p. incl. illus., tables, 14 refs.
(Contract DA 18-108-405-cml-518)
Unclassified report

DESCRIPTORS: (Metals, *Aluminum, *Corrosion, Oxidation, Air, Mercury compounds, Iodides, Humidity.) (*Corrosion research, Test methods, Oxides, X-ray diffraction analysis.) (Corrosive liquids, Salts, Phosphates, Chlorides, Nitrates, Sulfates, Bromides, Chromates.)

The oxidation of Al occurred linearly with time in the presence of mercuric halides and water vapor. The slope of this linear curve was constant at any particular relative humidity and increased with an increase in relative humidity. Additional data to be used in conjunction with all the previous oxidation-rate measurements are presented. Several new saturated-salt solutions were used to give relative humidities different from those used previously. The slopes of the oxidation-rate curves are tabulated along with the relative humidities obtained from the saturated-salt solutions. Rate curves are presented for experiments at 100%, 92.9, 74.9, 54.2, and 26.6 RH. The influence of the relative humidity upon the oxidation rate is noted. The lazy - S curve is similar to one previously reported, but additional points are included which change the shape somewhat. The rapid increase in oxidation rate is still noted in the 60-75% RH. range. (Author)

AD-271 142 Div. 17
(TISTM/EJH) OTS price $1.00

Watertown Arsenal Labs., Mass.
CHARPY IMPACT TESTS OF 4340 STEEL AND 6A1-6V-2Sn TITANIUM ALLOY, USING STANDARD AND THIN CHARPY SPECIMENS.
Rept. on Special Ammunition - XM28, XM29,
by Armando A. Iannelli and F. J. Rizzitano. Jan 62, 31p. incl. illus. tables, 8 refs. (Rept. no. WAL TR 112.5/3)
(Proj. 512-15-018)
Unclassified report

DESCRIPTORS: (*Steel, *Titanium alloys, Aluminum alloys, Vanadium alloys, Tin alloys, Aging, Heat treatment, Sheets, Sandwich construction, Temperature, Low temperature research, High temperature research, Impact shock, Thickness, Mechanical properties.) (Tests, Test methods.)

Charpy impact energy tests were carried out for high-strength 4340 steel and 6A1-6V-2Sn titanium. The tests were run at temperatures encompassing the brittle to maximum ductile type of failure. Both materials were heat treated to various strength levels. Standard thickness specimens and specimens of 1/2, 1/3, 1/4 and 1/8 of standard thicknesses were tested. Charpy impact energy-temperature curves are plotted for both materials. The effect of specimen thickness and of heat treatment are also shown. The results of 3 types of Charpy specimens, the thin single, the thin twin, and the laminated, are plotted and compared. The Charpy impact energy for each limina of equal thickness is equal regardless of the number of laminae fractured at one time (i.e., Charpy impact energy is linearly related to number of laminations of equal thickness). (Author)

AD-271 143 Div. 17, 30
(TISTM/EJH) OTS price $2.60

Watertown Arsenal Labs., Mass.
DETERMINATION OF DEFECT GEOMETRY BY ULTRASONIC PULSE ANALYSIS TESTING.
Rept. on Research of Materials for High Temperature Use,
by Otto R. Gericke and John J. Maguire. Jan 62, 20p. incl. illus. (Rept. no. WAL TR 830.5/3)
(Proj. 5B93-32-004)
Unclassified report

DESCRIPTORS: (Metals, *Non-destructive testing, *Ultrasonics, Attenuation, Frequency, Effectiveness, Test methods.) (Aluminum, Grains (Metallurgy), Microstructure.)

Test specimens containing artificial defects of various configurations were consecutively subjected to a conventional ultrasonic pulse echo test and a novel pulse reflection method employing polychromatic ultrasonic energy. Results are compared from the viewpoint of the effectiveness of these two methods to differentiate among various flaw geometries. It was found that the polychromatic pulse method permits a more conclusive geometry inspection for defects which are smaller than the ultrasonic search beam diameter. (Author)

AD-271 401 Div. 17, 26
(TISTM/GEC) OTS price $2.25

Little, Arthur D., Inc., Cambridge, Mass.
BASIC PARAMETERS OF METAL BEHAVIOR UNDER HIGH RATE FORMING,
by P. C. Johnson, B. A. Stein, and R. S. Davis. Nov 61, 99p. incl. illus. tables, 21 refs.
(Contract DA 19-020-ORD-5239, Proj. 5B93-32-004)
(WAL TR 11.2/20)
Unclassified report

DESCRIPTORS: (*Aluminum, *Explosive forming.) (Tests, Elasticity, Wave transmission, Plasticity, Stresses, Tensile properties, *Mechanical properties.) *Metals, Alloys.

A summary is presented of the steps taken in the stage of a research program designed to provide: information on the mechanical properties of metals (and alloys) under impulsive loading conditions and an improved understanding of how the energy source, die design, and other parameters

influence the process. The experiment described involves high-speed position-time measurements of a freely expanding ring of the material under study. Preliminary results on high-purity as-cast aluminum indicate that the increases in the stress for flow and the work-harening rate at a strain rate of 2 to 5 thousand/sec were substantially greater than those obtained at 2 x 10 to the -3rd power/sec with a standard tensile tester. (Author)

AD-271 412 Div. 17, 26
(TISTM/GEC) OTS price $3.60

Titanium Metals Corp. of America, Toronto, Ohio.
THE PRODUCTION AND WELDING OF HEAVY Ti-13V-11Cr-3Al TITANIUM ALLOY PLATE.
Final rept.,
by D. R. Mitchell and H. D. Kessler. 17 Nov 61.
29p. incl. illus. tables, 4 refs.
(Contract NOa(s) 60-6092-c)
Unclassified report

DESCRIPTORS: (*Metal plates, *Titanium alloys, Vanadium alloys, Chromium alloys, Aluminum alloys, Welding, Arc welding, Gases, Argon, Helium.) (Welding rods, Welded joints, Welds, Mechanical properties, Tensile properties, Deformation, Impact shock, Creep, Hardness, Microstructure, Fracture (Mechanics).) Chemical analysis, Microphotography, Manufacturing methods, Production.

It was demonstrated that two-inch thick Ti-13V-11Cr-3Al plate could be welded in open air by an automatic inert gas metal-arc welding process without excessive contamination. A mixture of A and He was the most effective gas for the welding torch. The use of matching filler material in the weld resulted in severe cracking. A 500 F pre-heat eliminated gross cracking, but there was still evidence of micro-cracking in the weld. The use of dissimilar filler materials (Ti-6Al-4V and Ti-8Al-1Mo-1V) without preheat produced crack-free welds. A weld made with commercially pure Ti filler developed longitudinal cracks. All the welds tested for mechanical properties were radiographed. There was no evidence of porosity, internal cracking, or other defects. In general, the heat affected zones of the welds exhibited tensile and impact strengths equivalent to those of the base metal, but ductilities were slightly lower. (Author)

AD-271 429 Div. 17, 14, 26
(TISTM/EJH) OTS price $9.60

Narmco Industries, Irc., San Diego, Calif.
DEVELOPMENT OF EXO-REACTANT INORGANIC ADHESIVE SYSTEM.
Summary technical rept., 1 July 58-31 Jan 61,
by William Bassett, Robert Caughey, and Roger A. Long. 31 Jan 61, 63p. illus. tables.
(Contract NOa(s) 60-6061-c; Continuation of Contract NOa(s) 58-857-c)
Unclassified report

DESCRIPTORS:, (*Stainless steel, Sheets, *Sandwich panels, *Honeycomb cores, Bonding, Bonded joints, Metal joints, Brazing.) (*Adhesives, *Metal seals, Seals, Materials, Ceramic materials, Glass, Copper alloys, Silver alloys.) (High temperature research, High pressure research, Processing, Mechanical properties, Tensile properties.)

Combination metal-oxide and metal-glass exothermic systems were developed. These exothermic Ag base and Cu base adhesives gave metallic bonds which on the basis of stainless steel tensile lap shear strengths showed strengths in excess of 9000 psi at all temperatures up to 800 F. The process consisted of combining reactive and inert constituents that produced a fluid glass, which could be squeezed out of the bond area, and a stainless steel wetting alloy that remained in the bond area as a braze filler metal. The adaptation of the Ag base exo-reactant adhesive systems to stainless steel honeycomb panel bonding was accomplished. Exothermic adhesive bonded stainless steel 15-7 Mo honeycomb panels were evaluated and compared with equivalent tested conventionally brazed panels. The exothermically bonded stainless steel panels gave flexure and edgewise compression strengths of 84,300 and 61,900 compared to 160,000 and 115,000 psi, respectively, provided by the conventionally furnace brazed panels. (Author)

AD-271 458 Div. 17, 4, 25
(TISTM/BRW) OTS price $.75

Metals and Ceramics Lab., Aeronautical Systems, Div., Wright-Patterson Air Force Base, Ohio.
THE EFFECT OF CONCURRENT STRESSING ON THE AIR OXIDATION OF TANTALUM.
Rept. for Sep 59-Nov 60 on Metallic Materials,
by B. A. Wilcox and F. H. Beck. Apr 61, 22p. incl. illus. tables, 32 refs. (In cooperation with Ohio State U., Columbus)
(Proj. 7351)
(WADD TR 60-839) Unclassified report

DESCRIPTORS: (*Tantalum, Oxidation in Air at Temperature, Thermal stresses, Loading, Energy, Determination, Equations.) (Oxides, X-ray diffraction analysis.) (Oxygen, Diffusion, Scale.) Stresses, Metals.

The air oxidation of unstressed tantalum, measured by decrease in metal thickness over the temperature range 427 to 649 C (800 to 1200 F) was found to proceed initially according to a parabolic rate law. At temperatures of 510 to 649 C (950 to 1200 F) the oxidation changed from parabolic to linear behavior, after times at temperature sufficient to allow breakdown of the protective initial oxide scale. The transition time from parabolic to linear oxidation decreased with increasing temperature. Linear and parabolic rate constants were evaluated for the scaling process. Activation energies of 28,600 cal/mol for linear oxidation, and of 40,800 cal/mol for parabolic oxidation were determined. Oxidation tests in the stressed condition, (20,000 and 24,000 psi) increased the parabolic scaling rate about two to four times over than of unstressed samples at the same temperature. No enhancement of the linear oxidation rate was noted. (Author)

AD-271 473 Div. 17, 26, 12
(TISTM/EJH) OTS price $3.60

Goodyear Aircraft Corp., Akron, Ohio.
STRUCTURAL FABRIC PROGRAM.
Interim technical progress rept., 1 Oct-31 Dec 61,
by J. T. Harris and J. O. Miller. Dec 61, 27p. incl. illus.
(Contract AF 33(600)43036, ASD Proj. 7-904)
(ASD TR 7-904(II)) Unclassified report

DESCRIPTORS: (*Metallic textiles, Threads, Stainless steel, Nickel alloys, Chromium alloys, Cobalt alloys, Manufacturing methods, Production, *Industrial equipment, Design.) (Re-entry vehicles, Structures.)

The glide re-entry vehicles presently being designed require large low-density structures. The use of fabrics for the structural material not only answers this requirement but provides the advantage of being packageable in a small volume for ease of storage and handling on the ground with the additional advantages of maximum utilization of missile payload volume and minimum effect on the aerodynamic performance of the missile during ascent. The ultimate objective is a loom having the capabilities of weaving large AIRMAT structures. These capabilities will be demonstrated by weaving AIRMAT specimens in 2 categories. Rene' 41 AIRMAT; and Type 304 stainless steel AIRMAT. It is also intended that the loom will have the capability of weaving shapes. Design studies and prototype evaluation were made to establish the design requirements for the structural fabric loom specification and to determine, the detail design requirements for the loom. (Author)

AD-271 478 Div. 17, 25
(TISTM/BRW) OTS price $7.60

Research Inst., U. of Michigan, Ann Arbor.
A STUDY OF SUBSTRUCTURE AND CREEP RESISTANCE USING NICKEL, WITH PRELIMINARY DATA FOR NIOBIUM.
Rept. for 15 June 59-30 Sep 60,
by A. Phillip Coldren and James W. Freeman.
Nov 61, 64p. incl. illus. tables, 4 refs.
(Contract AF 33(616)5466, Proj. 7351)
(ASD TR 61-440) Unclassified report

DESCRIPTORS: (*Nickel, *Niobium, *Creep, Deformation, Lattices, Hardening, *Crystal structure, Heat treatment, Rolling mills.) (Test methods, Preparation, Electrolytic polishing, Phase transitions, Heat of Fusion, Melting, Electron guns, Grains (Metallurgy), Rupture, Microstructure, X-ray diffraction analysis.) Metals.

A correlation obtained between instantaneous creep rate and a quantitative measure of the substructure density at the same time during primary creep of Ni at 1550 F and 3360 psi indicated that the development of substructure was responsible for primary creep. The correlation held for substructures developed at higher stress before testing at 3360 psi. These test conditions were used because substructures were developed which could be clearly delineated by etch pitting. Attempts to correlate substructures with varied creep-rupture properties at 1100 F from hot rolling failed, due to lack of sufficient polygonization for delineation and to interference with the decorator effect of precipitation. Extremely limited data for Nb indicated that creep-rupture properties were influenced by rolling conditions even though there was very little strain hardening in this material. (Author)

AD-271 480 Div. 17
(TISTM/BRW) OTS price $7.60

Michigan U., Ann Arbor
EFFECT OF CREEP-EXPOSURE ON MECHANICAL PROPERTIES OF RENE' 41.
Rept. for 1 Apr 59-31 Mar 60, on Materials Application,
by Jeremy V. Gluck and James W. Freeman. Aug 61, 69p. incl. illus. tables, 19 refs.
(Contract AF 33(616)6462, Proj. 7381)
(ASD TR 61-73) Unclassified report

DESCRIPTORS: (*Nickel alloys, *Cobalt alloys, Chromium alloys, Molybdenum alloys, Titanium alloys, Aluminum alloys, *Creep on Mechanical properties and Microstructure.) (Test equipment, Heating, Strain gages, Extensometers, Deformation, Load distribution, Impact shock, Microscopy, Electron microscopy, X-ray diffraction analysis.) (High temperature research, Thermal stresses, Time, Grains (Metallurgy), Crystal structure, Phase transitions, Carbides, Temperature, Plastic flow, Hardening, Rupture.) Alloys.

An investigation of the influence of creep-exposure on the mechanical properties at room temperature of Rene' 41 alloy is in progress. The objestives are to delineate the conditions causing changes in these properties and to develop general principles for predicting the influence of creep on such properties of Ni base superalloys. The results for exposures at 1200 to 1800 F and for 10 to 200 hr show that thermally-induced structural changes reduce room temperature strength and ductility when the exposure temperatures are 1500 F or higher. Limited data indicate that surface reactions also reduce properties with the temperature range of the effect extending to lower temperatures than 1500 F. (Author)

AD-271 503 Div. 17
(TISTM/GEC) OTS price $7.60

Armour Research Foundation, Chicago, Ill.
A STUDY OF THE EFFECT OF MELTING PRACTICE ON THE FATIGUE BEHAVIOR OF HIGH-STRENGTH STEEL.
Rept. for Mar 60-June 61, on Metallic Materials, by Harvey B. Nudelman and John Sheehan. Nov 61, 65p. incl. illus. tables, 4 refs.
(Contract AF 33(616)6290, Proj. 7381)
(ASD TR 61-296) Unclassified report

DESCRIPTORS: (*Steel, *Nickel alloys, *Molybdenum alloys, *Tungsten alloys.) (Processing, Heat treatment, Melting, Induction heating, Deoxidation, Silicon, Aluminum, Carbon.) Tests, Mechanical properties, Fatigue (Mechanics), Tensile properties, Alloys.

Special C-Al deoxidation practice provided a significant increase in the fatigue properties of an induction-melted Ni-Mo high-strength steel. Prot evaluation of cylindrical R. R. Moore fatigue specimens gave E sub p/UTS ratios of 0.500 and 0.555 at ultimate tensile strength levels of 274 and 200 ksi respectively. Vacuum arc and vacuum induction remelting of the specially deoxidized material reduced the fatigue strength to lower values than that characteristic of standard melting practice. The fatigue properties of vacuum-melted high-purity raw materials were inferior to those prepared by induction melting. The harmful effect of Si additions on the fatigue properties of these steels was related to the sequence of addition; the damage was minimized by adding the Si after the completion of the Al killing treatment. Ni-Mo steels were prepared by standard practice and special C-Al practice and tested in axial fatigue in the notched and unnotched conditions. The resultant scatter was too great to indicate any definite trends. (Author)

AD-271 526 Div. 17, 26
(TISTM/GEC) OTS price $3.50

Metals and Ceramics Lab., Aeronautical Systems Div., Wright-Patterson Air Force Base, Ohio.
MECHANICAL PROPERTIES OF TWO TITANIUM FORGING

ALLOYS. Ti 155A AND C135AMo.
Rept. Jan 58-Nov 60 on Metallic Materials,
by R. G. Henning. Apr 61, 208p. incl. illus. tables.
(Proj. 7351)
(WADD TR 61-43) Unclassified report

DESCRIPTORS: (*Titanium alloys for *Forging.) (Tests, Mechanical properties, Tensile properties, Elasticity, Shear stresses, Thermal stresses, Stability, Impact shock, Fracture Mechanics). Torsion meters, High temperature research, Low temperature research.) (Mechanical properties, Tables.) Alloys.

Mechanical properties of two annealed titanium forging alloys, Ti 155A and C135AMo, were obtained. These properties included tensile, compressive, pin shear, bearing, and notched tensile at room, 200, 400, 600, 800, and 1000 F temperatures. Stressed and nonstressed exposure tests were conducted at 600, 800, and 1000 F. Torsion tests were conducted at room temperature only. Properties vs. temperature graphs and tensile, compressive, and bearing stress-strain curves were presented. The ratio of the various properteries to room temperature tensile results were plotted vs. temperature. (Author)

AD-271 528 Div. 17, 1
(TISTM/GEC) OTS price $7.60

Directorate of Materials and Processes, Aeronautical Systems Div., Wright-Patterson Air Force Base, Ohio.
THE EFFECT OF CADMIUM PLATING ON AIRCRAFT STEELS UNDER STRESS CONCENTRATION AT ELEVATED TEMPERATURES.
Rept. for Sep 56-Sep 59 on Metallic Materials,
by E. M. Kennedy, Jr. Sep 61, 66p. incl. illus tables.
(Proj. 7351)
(WADD TR 60-486) Unclassified report

DESCRIPTORS: (*Steel, Airframes, *Cadmium plating.) (Processing, Heat treatment, Austenite, Electroplating, Cadmium compounds, Fluorides, Borates, Diffusion, Nickel alloys, Cadmium alloys, Vapor plating, Cadmium.) (Tests, Tensile properties, Stresses, Fracture (Mechanics), Fatigue (Mechanics), Impact shock, Microstructure, Mechanical properties.) Alloys.

A study was conducted of the effects of Cd plating on stressed steels at elevated temperatures. The experimental procedures involved several tests characterized as the stress-rupture, tensile, and fatigue tests. Materials studied consisted of several aircraft quality SAE steels; namely, 4340, 4130, 1095, 18-8, and H-13 hot work die steels. Strength levels from 180,000 to 300,000 psi, as suitable for the several steels, were evaluated for a variety of conditions of stress concentration. The steels examined, except the austenitic stainless steels, were susceptible to embrittlement by Cl plating at elevated temperatures. With decreasing temperatures, the noticeable effect of Cd plating on the properties of steels was correspondingly decreased. All the steels examined showing an effect on one property, showed similar effects on the other properties. (Author)

AD-271 571 Div. 17
(TISTM/GEC) OTS price $9.60

Michigan U., Ann Arbor.
EFFECT OF CREEP-EXPOSURE ON MECHANICAL PROPERTIES OF RENE 41. PART II: STRUCTURAL STUDIES, SURFACE EFFECTS, AND RE-HEAT TREATMENT.
Rept. for 1 Apr 60-31 May 61 on Materials Application,
by Jeremy V. Gluck and James W. Freeman. Nov 61, 103p. incl. illus. 22 refs.
(Contract AF 33(616)6462, Proj. 7381)
(ASD TR 61-73, pt. 2) Unclassified report

DESCRIPTORS: (*Heat resistant alloys, Alloys, *Nickel alloys, *Cobalt alloys, *Chromium alloys, Molybdenum alloys, *Creep effects Mechanical propertie, Microstructure, Phase studies.) (High temperature research, Tests, Hardness, Tensile properties, Impact shock, Rupture, Deformation, Surface properties, Heat treatment.) (X-ray diffraction analysis, Electron diffraction analysis, Electron microscopy, Microscopy, Extensometers, Dilatometers, Thermocouples.)

Investigation of the influence of creep-exposure on the mechanical properties of Rene' 41 at room temperature was continued. The results showed that thermally-induced structural changes reduced the strength and ductility for exposures at temperatures from 1400 to 1800 F. Reduced yield strength was due mainly to a decrease in the measured volume fraction of gamma prime precipitate and secondarily to an increase in the gamma prime particle size. For the conditions studied, gamma prime was sufficiently stable up to 1400 F so that yield strength was not affected. Ductility was reduced by thermally-induced carbide precipitation in the grain boundaries in the temperature range from 1400 to 1800 F. Ductility reached a minimum after about 100 hr at 1700 to 1800 F and was not further decreased by creep. Creep had little effect on the gamma prime reactions. (Author)

AD-271 580 Div. 17
(TISTM/BRW) OTS price $3.00

Manufacturing Labs., Inc., Cambridge, Mass.
RESEARCH AND DEVELOPMENT ON HIGH-PRESSURE-HIGH-TEMPERATURE METALLURGY.
Rept. for Oct 59-Feb 61 on Metallic Materials,
by L. Kaufman, S. V. Radcliffe and others.
Aug 61, 156p. incl. illus. 78 refs.
(Contract AF 33(616)6837, Proj. 7351)
(WADD TR 60-893) Unclassified report

DESCRIPTORS: (High pressure research, High temperature research, Metallurgy, *Phase studies.) (Hydrostatic pressure, Phase transitions, *Iron alloys, Chromium alloys, Nickel alloys, Silicon alloys.) (Iron alloys, *Carbon alloys, Austenite.) (*Molybdenum compounds, *Carbides, Synthesis.) (Copper, *Brass, Microstructure, Stresses, Reaction Kinetics, Relaxation time.) (*Aluminum compounds, Oxides, Sintering.) (Cerium, Hall effect, Measurement.) Brittle materials, Alloys, Metals, Test equipment, X-ray diffraction analysis.

The experimental investigations on the effect of high hydrostatic pressure on phase transformations in various substitutional Fe base alloys, including Fe-Cr, Fe-Ni and Fe-Sc, yield data which are in close agreement with theoretical prediction. A study of the effects of pressure on Fe-C alloys shows a general shift of the equilibrium phase boundaries to lower C contents and temperatures with pressure. Pressure also acts to retard both the rate of tempering and the isothermal transformation of metastable austenite. The synthesis of fcc MoC was carried out at pressures in excess of 35 kilobars at a temperature of 2000 C. The thermally activated recovery and recrystallization processes were retarded in a study of Cu and 70-30 brass. (Author)

AD-271 582 Div. 17, 25
(TISTM/BRW) OTS price $3.00

Research Chemicals, Inc., Burbank, Calif.
PROPERTIES OF YTTRIUM AND THE RARE EARTH METALS OXYGEN AND ALLOY SYSTEMS. OXYGEN AND ALLOY SYSTEMS.
Rept. for Oct 59-Oct 60 on Metallic Materials,
by Bernard Love. Aug 61, 179p. incl. illus. tables, 49 refs.
(Contract AF 33(616)6829, Proj. 7351)
(WADD TR 61-123)
Unclassified report

DESCRIPTORS: (Phase studies, *Yttrium, *Rare earths, *Oxygen, Solubility, Erbium, Neodymium, Samarium, Eutectics, Intermetallic compounds, Phase transitions, Metallurgical analysis, Grains (Metallurgy), Mechanical properties, Tensile properties, Microstructure.) (Alloys, Metals, Preparation, Purification, Corrosion research.) (Cobalt alloys, Nickel alloys, Tantalum alloys, Niobium alloys, Zirconium alloys, Beryllium alloys.) *Rare earth compounds, *Rare earth elements.

Studies were made of systems containing Y and the lanthanide elements in efforts to produce alloys with improved mechanical and atmospheric corrosion properties at high temperatures. Alpha Y and Er are miscible. In the Y-Nd system there is partial solubility and an intermediate phase is present. The solubility of O is low in Y, Er, Nd, and Sm. Alpha-beta transformations are essentially unaffected. A high temperature monoxide is proposed. The solubility of Er in Co is low. The first compound is Co17Er2. Ta and Nb form extensive liquid immiscibility regions with rare earths, terminating in a monotectic near the Ta (Nb) end of the systems; a eutectic at the rare earth end. Solubility is very low. Improved atmospheric corrosion resistance was found for some Nb and Co compositions with rare earth additions. The tensile properties of Y were improved by alloying with Er or Zr. Purification of Y and Er, and improved analytic methods are described. Be with Er additions shows grain refinement. (Author)

AD-271 586 Div. 17, 25
(TISTM/BRW) OTS price $3.60

Keck, W. M., Lab. of Engineering Materials, Calif. Inst. of Tech., Pasadena.
ETCHING OF HIGH PURITY ZINC.
by R. C. Brandt, K. H. Adams, and T. Vreeland, Jr. Dec 61, 31p. incl. illus. 15 refs. (Technical rept. no. 1)
(Contract Nonr-22037, Proj. NR 031-677)
Unclassified report

DESCRIPTORS: (*Single crystals, *Zinc, Crystal structure, Microstructure, Lattices, Deformation.) (Preparation, Purification, Zone melting, Metallic crystals, Growth, Electrolytic polishing, Solutions.)

An etching technique for revealing dislocations in high purity Zn single crystals without the addition of solute impurities was developed. The technique involves surface doping prior to chemical polishing. Evidence for a one to one correspondence between etch figures and dislocations is presented, together with some preliminary observations of slip on (0001) basal and (1212) pyramidal planes and twinning in Zn. (Author)

AD-271 608 Div. 17
(TISTM/EJH) OTS price $10.10

Battelle Memorial Inst., Columbus, Ohio.
METALLURGICAL AND MECHANICAL CHARACTERISTICS OF HIGH-PURITY TITANIUM-BASE ALLOYS.
Rept. for 1 Nov 59-31 Jan 60 on Metallic Materials,
by Albert G. Imgram, Dean N. Williams and others. Aug 61, 119p. incl. illus. tables, 7 refs.
(Contract AF 33(616)5462, Proj. 7351)
(WADC TR 59-595, pt. 2)
Unclassified report

DESCRIPTORS: (*Titanium alloys, Aluminum alloys, Hafnium alloys, Zirconium alloys, Vanadium alloys, Chromium alloys, Niobium alloys, Tungsten alloys, Aging, Hardness, Heat treatment, Microstructure, Mechanical properties, Phase studies, Phase transitions, Tensile properties, Impact shock.) Tests, Alloys.

The relationships between mechanical properties, alloy composition, microstructure, and thermal history were studied for high-purity Ti-base alloys. The alloy systems investigated include Ti-Al, Ti-Zr, Ti-Hf, Ti-Al-Zr, Ti-Al-Hf, Ti-Al-Cb, Ti-Cb, Ti-W, Ti-V-Cr, and Ti-V-Cr-Al. Mechanical-property data, including tensile and flow properties, impact behavior, hardness, aging, and cooling-rate data were determined. The metallurgical principles involved are discussed. (Author)

18. MILITARY SCIENCES AND OPERATIONS

AD-270 960 Div. 18
(TISTB/LH) OTS price $1.60

Operations Analysis Office, Air Force, Washington, D. C.
COMMAND AND CONTROL INPUTS TO OPERATIONS ANALYSIS STUDIES,
by Lawrence G. Starkey. Jan 62, 15p. (Operations analysis paper no. 8)
Unclassified report

Presented to the Operational Research Conference held on 6-7 December 1961 at Hq., Allied Air Forces Central Europe, Fontainebleau, France.

DESCRIPTORS: (*Operations research, *Military operations, Civilian defense systems, Warfare, Control.)

AD-271 440 Div. 18, 8, 6, 30, 28
(TISTA/VGW) OTS price $9.60

HRB Singer, Inc., State College, Pa.
DISPLAY PROBLEMS IN AEROSPACE SURVEILLANCE SYSTEMS.
Final rept.,
by George Grant and Robert Hostetter. 30 Oct 61, 122p. incl. illus. tables, 75 refs. (Rept. no. 256-F)
(Contract AF 19(604)7368)
(ESD TDR 61-57) Unclassified report

Original contains color plates. All ASTIA reproductions will be in black and white. Original may be seen in ASTIA Hq.

DESCRIPTORS: (*Aerial reconnaissance, *Display systems, Data processing systems, Information theory, Combat information centers, Air control centers, *Human engineering, Design.) (Radar equipment, Targets, Target recognition, Coding by Colors, Configuration.)

The over-all objective was to determine the information presentation requirements for human data processing roles in future air and aerospace surveillance systems. The conclusions and recommendations listed are based upon information gathered in a comprehensive literature search and pertinent data reflecting the present state of the art in displays and related human data processing roles. From the data available, this report provides: (1) An approach to the problem of specifying and comparing human information presentation requirements; (2) A discussion of display problems and requirements based on currently available research data; (3) A structure for the collection and use of system information requirements in determining display needs; (4) A technique (Profile Method) for use in screening and evaluating displays in terms of informational requirements; and (5) A program for future research in areas that will optimize man as a component in the system. (Author)

AD-271 444 Div. 18
(TISTB/LH) OTS price $9.60

Operations Research Office, Johns Hopkins U., Bethesda, Md.
CIVIL AFFAIRS: THE FUTURE PROSPECTS OF A MILITARY RESPONSIBILITY,
by James E. King, Jr. June 58, 109p. 1 ref. (Staff Paper no. ORO-SP-55; CAMG Paper no. 3)
Unclassified report

DESCRIPTORS: (*Operations research, *Civilian defense systems, Foreign policy, *Military government.)

19. NAVIGATION

No Entries

20. NUCLEAR PHYSICS AND NUCLEAR CHEMISTRY

AD-270 903 Div. 20, 15
(TISTP/MFA) OTS price $1.60

RIAS, Inc., Baltimore, Md.
UNITARITY, CROSSING SYMMETRY AND COMPLEX POLES IN LOW ENERGY SCATTERING THEORY,
by B. H. Bransden and J. W. Moffat. 22 Jan 62, 16p. 9 refs.
Unclassified report

DESCRIPTORS: (Particles, *Pions, Energy, *Scattering, Resonance absorption, Wave analysis, Resonance scattering, Diffraction.) (Polynomials, Integrals, Algebraic topology.)

AD-271 023 Div. 20
(TISTP/FR) OTS price $4.60

Army Engineer Research and Development Labs., Fort Belvoir, Va.
THE SM-1 ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM, NOVEMBER 1954-DECEMBER 1960,
by Maurice Pressman and Paul B. Pruett. 31 Aug 61, 36p. incl. illus. tables (Technical rept. no. 1691-TR)
Unclassified report

DESCRIPTORS: (Measurement of *Radiological contamination from *Pressurized water reactors in Virginia.) (Radioactive fall-out, Precipitation, Potomac River, Sedimentation, Soils, Fishes, Water.)

An environmental radiological monitoring program was conducted. All data obtained during a period extending from 1 1/2 years prior to SM-1 reactor start-up through more than 3 years of reactor operation are summarized. The period extended from November 1954 through December 1960. Samples assayed for radioactivity include the following: River water and botton silt; SM-1 condenser cooling water; subsurface ground water; rain and snow; atmospheric particles obtained by air filtration and fallout; and biota. The report concludes that after more than 3 years of SM-1 reactor operation, no significant increase has been noted in the radiological background level in the Fort Belvoir area. (Author)

AD-271 036 Div. 20
(TISTB/AW) OTS price $4.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
RADIATION EFFECTS ON SOLAR CELLS AND GLASS: AN ANNOTATED BIBLIOGRAPHY,
comp. by Alfred A. Beltran and Eugene E. Graziano. Oct 61, 46p. 118 refs. (Special bibliography no. SB-61-58; Rept. no. 3-77-61-17) (Contract AF 04(647)673)
Unclassified report

DESCRIPTORS: (*Bibliography, *Radiation effects, *Solar cells, Glass.)

AD-271 351 Div. 20, 4, 14, 8, 17
(TISTP/FR) OTS price $2.60

Radiation Effects Information Center, Columbus, Ohio.
MONTHLY ACCESSION LIST 54.
Rept. for 1-31 Dec 61.
15 Jan 62, 20p. (REIC Accession list no. 54)
(Contract AF 33(616)7375, Proj. 1448)
Unclassified report

DESCRIPTORS: (Chemistry, Electronics, Polymers, Radiation damage, Metals, Inorganic substances, Organic compounds, Dosimeters, *Radiation effects, *Bibliography.)

AD-271 359 Div. 20, 25
(TISTP/TL) OTS price $8.60

Sarah Mellon Scaife Radiation Lab., U. of Pittsburgh, Pa.
LOW ENERGY NUCLEAR AND ELECTRON PHYSICS.

Final rept., 1 Nov 58-31 Oct 61 on Basic Research,
by L. A. Page, F. E. Obenshain and others.
31 Oct 61, 88p. incl. illus. refs.
(Contract DA 36-034-ORD-2765, Proj. BR-01(TB-0001 (2211))
(AROD rept. no. 2211:3) Unclassified report

DESCRIPTORS: (*Electrons, Nuclear physics, Nuclear energy, Gases, *Positronium, Electric fields, Particles, Magnetic fields, Scattering, Polarization.) (*Atomic orbitals, Moments, Beta ray particles, Gamma rays, Argon, Nitrogen, Oxygen.) (Geometry, Mathematical analysis.)

Contents:
Strong electric field experiments on positronium in gases
Results with direction of field E averaged
Results associated with the sign of field E
Circularly polarized gamma analysis
Compton analyzer for plane polarized Gammas using ring geometry
On plane polarization analysis by two Compton scatterings in series
Multi-mode charged particle analyzer

AD-271 379 Div. 20, 17
(TISTP/TL) OTS price $1.60

Naval Research Lab., Washington, D. C.
EFFECTS OF NUCLEAR RADIATION ON THE PROPERTIES OF REACTOR STRUCTURAL MATERIALS,
by J. R. Hawthorne, L. E. Steele, and W. S. Pellini. 22 Jan 62, 18p. incl. illus. 13 refs. (NRL rept. no. 5731)
Unclassified report

DESCRIPTORS: (*Nuclear power plants, Materials, *Steel, *Radiation effects, *Radiation damage, Mechanical properties, Stresses, Temperature.)

The exposure of pressure-vessel steels to moderate neutron dosages (n/sq cm greater than 1.0 Mev) results in major changes in notch-ductility properties. The available data indicate that neutron dosage and irradiation temperature are the primary factors controlling notch-ductility behavior. Specific influences involving neutron spectrum and neutron dose rate (n/sq cm/sec) have not been detected; however, environmental differences in the test-reactor facilities utilized are not considered sufficient to eliminate the possibility of the existence of such effects.

AD-271 409 Div. 20
(TISTM/EJH) OTS price $1.60

Palmer Physical Lab., Princeton U., N. J.
PARTICLE PRODUCTION AT LARGE ANGLES BY 10-33 BEV PROTONS INCIDENT ON ALUMINUM AND BERYLLIUM,
by V. L. Fitch, S. L. Meyer, and P. A. Piroue.
31 Jan 62, 4p. illus. (Technical rept. no. 29)
(Contract Nonr-185806; In cooperation with Naval Ordnance Lab.)
Unclassified report

DESCRIPTORS: (*Proton bombardment, Proton beams, *Aluminum, *Beryllium, Particles, Mesons, Antiprotons, Velocity, Measurement, Deuterons, Tritons.) Synchrotrons.

As part of the beam survey program at the Brookhaven alternating gradient synchrotron, a mass analysis was made of the relatively low momentum particles emitted from Al and Be targets when struck by 10-33 Bev protons. The mass of the particles was determined from momentum and velocity, using magnetic deflection and time-of-flight technique. Two scintillation counters determined the distance over which the time of flight was measured. This distance was 95 ft. at 13 degrees and 12 ft. at 45 and 90 degrees. A 256 channel pulse height analyzer preceded by a time-to amplitude converter was used to record the time difference between pulses in the 2 scintillation counters. (Author)

AD-271 523 Div. 20
(TISTB/LH) OTS price $8.60

Aerospace Information Div., Washington, D. C.
NUCLEAR REACTIONS BIBLIOGRAPHY.
15 Dec 61, 96p. (AID rept. 61-7)
Unclassified report

DESCRIPTORS: (*Bibliography, *Nuclear reactions, Thermonuclear reactions, Photonuclear reactions, USSR.)

This bibliography is a guide to Soviet literature on nuclear reactions. The materials on which it is based are the Soviet monographs, articles, conference proceedings, newspapers, and other public sources available at the Aerospace Information Division and the Library of Congress prior to June 1960. The scope of the work is necessarily broad to accommodate readers with varying requirements and fields of interest. The 682 entries are arranged alphabetically by author within each of the 13 subject headings. Titles of Soviet monographs are given in translation. Annotations are provided when clarification seems necessary. (Author)

AD-271 611 Div. 20
(TISTP/WH) OTS price $1.60

Cornell U., Ithaca, N. Y.
STUDIES OF OPTIMIZED REACTORS.
Final rept.,
by J. R. Lamarsh. 30 Sep 61, 11p. incl. table, 13 refs.
(Grant DA-ORD-31-124-61-G73)
(AROD rept. no. 2319:3)
Unclassified report

DESCRIPTORS: (*Test reactors, *Power reactors, Design.) (Reactor cores, Control rods.)

Results of theoretical studies of optimized reactor systems are presented. An optimized thermal reactor is defined as a system which is constructed in such a way that the thermal flux and/or power are inherently uniform in the power producing volume of the reactor, at least in the new clean core. Since the flux and/or power can also be adjusted to some extent by external control of the internal environment, i.e., the motion of control rods, fuel elements, etc., the term optimized as used in the present report also implies a minimum of external control. (Author)

21. NUCLEAR PROPULSION

No Entries

22. ORDNANCE

AD-270 930 Div. 22, 30
(TISTW/JRG) OTS price $1.60

Bureau of Mines, Pittsburgh, Pa.
HYPERVELOCITY IMPACT PHENOMENA.
Preliminary background rept.,
by Karl R. Becker, Richard W. Watson, and Frank C. Gibson. Nov 61, 9p. illus.
Unclassified report

DESCRIPTORS: (*Hypervelocity projectiles, Ammunition fragments, Particles, Hypersonics, Terminal ballistics, Effectiveness, Aluminum alloys, Alloys, Metal plates, Sheets, Failure (Mechanics), *Penetration, *Cratering, Spallation.) (Analysis of Cratering of Hypervelocity projectiles.) (Test equipment for Acceleration of Hypervelocity projectiles, Design.)

An investigation is being conducted to study the parameters governing the failure of thin metal plates under the impact of high-speed fragments; special emphasis is placed on the lightweight structural alloys. The geometrical features of the perforations, together with the spatial, mass, and velocity distributions of the ejecta produced in the perforation process, are of immediate interest. Longer range interests include perforation growth times and other variables considered important in the evaluation of recent theoretical approaches to the problem. (Author)

AD-271 165 Div. 22, 17
(TISTW/JRG) OTS price $2.60

Ballistic Research Labs., Aberdeen Proving Ground, Md.
SHOCK WAVES FROM EXPLODING WIRES AT LOW AMBIENT DENSITIES,
by F. D. Bennett and D. D. Shear. Oct 61, 34p. incl. illus. 12 refs. (Rept. no. 1152)
Unclassified report

DESCRIPTORS: (*Blast, *Shock waves, Copper, *Wire, *Explosions, Argon, Interferometers, Plasma physics, Electrons, Density.)

The recently discovered technique of streak interferometry was applied to study 4 mil Cu wires exploded into argon at reduced pressures. Typical interferograms at 1/16 atm show an intensely luminous, peripheral arc formed in an annulus several mm from the wire. When filters are used to diminish the diffuse light from the glow, clear fringes can be reduced in the entire glowing region. Near the tip, measured fringe-shifts are negative indicating the presence of electrons. No shock wave is seen. During an interval of about 1 microsec fringe-shifts near the periphery of the expanding glow change to positive values and a compressional shock wave can be seen to separate and propagate ahead. Estimates obtained from approximate interferogram reductions indicate electron densities as high as 10 to the 18th power/cc in the annular region of the arc. A sequence of interferograms at pressures 1/16 to 1 atm is presented and implications for the mechanism of shock production are discussed. (Author)

AD-271 353 Div. 22
(TISTW/JRG) OTS price $8.10

Rock Island Arsenal Lab., Ill.
FEASIBILITY AND CONCEPT STUDIES FOR RECOIL MECHANISM 37mm SPOTTING RIFLE, XM36,
by Herbert G. Noble, Jr. Dec 61, 81p. incl. illus. tables (Rept. no. 61-4566)
(Proj. no. 512-15-018)
Unclassified report

DESCRIPTORS: (*Guns, *Artillery, *Spotting rifles, *Recoil mechanisms, Feasibility studies, Mathematical analysis, Design, Tests.)

The feasibility of utilizing a hydro-spring recoil mechanism for the 37mm spotting gun, XM77, adapted to the XM29 delivery system is indicated. The mechanism can be concentric to the spotting rifle, utilizing only the spotting rifle as a recoiling part. The recoil mechanism can then be mounted rigidly to the front of the XM64 gun tube. The spotting rifle will then be beneath and parallel to the major cal XM64 tube. It is considered feasible that the total spotting system (gun tube, breech, bracket, and recoil mechanism) can be built for a total weight of 55 lb. The weapon should be stable within a 10 mil deviation. The prototype mechanism of this type should provide a neat, compact, economical package, allowing for easy retrofitting to the existing XM29 system. (Author)

AD-271 468 Div. 22, 9
(TISTW/EET) OTS price $2.60

Naval Ordnance Lab., White Oak, Md.
THE SCALING OF UNDERWATER EXPLOSION PHENOMENA,
by Hans G. Snay. Jan 62, 18p. (NOLTR 61-46)
Unclassified report

DESCRIPTORS: (*Underwater explosions, Underwater explosion damage, Explosion bubbles, Gravity, Model tests, Statistical analysis.) Surface tension, Vapor pressure, Viscosity.

An attempt is made to summarize the problems and the semantics of scaling in a concise form without use of mathematical developments. The well known cube-root scaling is shown to be a consequence of Mach's similitude, the fourth-root scaling, of Froude's similitude. Requirements which must be satisfied for each of these scaling rules are discussed. Scaling of gravitational effects on underwater explosions (bubble behavior) is not possible by means of model tests conducted in a river or a pond, but requires test tanks in which the air pressure above the water can be reduced or the acceleration of gravity increased. The scaling of surface tension, vapor pressure, and viscosity are discussed. Model tests on damage to targets are not considered. A short discussion on the concept of approximate scaling is included. (Author)

AD-271 550 Div. 22
(TISTW/EET) OTS price $1.10

General Technology Corp., Elgin, Ill.
RESEARCH AND DEVELOPMENT STUDY OF STRESS-STRAIN CHARACTERISTICS OF SHELLS AND HIGH EXPLOSIVES.
Quarterly progress rept. no. 9, 13 Aug-30 Nov 61. 30 Nov 61, 8p. 5 refs.
(Contract DA 11-022-ORD-2917, Proj. TA2-8051)
Unclassified report

DESCRIPTORS: (*Cylindrical bodies, *Explosives, *Projectiles, Mechanical properties, Stresses, *High explosive ammunition, Deformation, Design, Test methods, Digital computers.) (Cylindrical bodies, Stresses, Measurement, Rotating bands.)

Division 23 - PERSONNEL AND TRAINING
Division 24 - PHOTOGRAPHY AND OTHER REPRODUCTION PROCESSES

The objectives during the current report period were: (1) to prepare and complete experiments concerned with the study of the interaction between shell fillers and shell walls (filler support characteristics); (2) to prepare for continuation of the study of yielding in the vicinity of the rotating band; (3) to begin preparations for the study of the interaction between shell filler and shell base; and (4) to begin preparations for the study of filler properties under firing conditions. (Author)

23. PERSONNEL AND TRAINING

AD-271 150 Div. 23
(TISIP/JMP) OTS price $1.75

Armed Services Technical Information Agency, Arlington, Va.
TEACHING MACHINES. AN ASTIA REPORT BIBLIOGRAPHY, comp. by J. M. Powers. 15 Feb 62, 388 refs.
Unclassified report

DESCRIPTORS: *Teaching machines, *Bibliography, *Training devices, *Learning, *Education, *Military training.

This bibliography was prepared in response to numerous inquiries concerning self-instructional devices and their application to a variety of learning situations. Military interest in teaching machines has increased significantly because of their present and potential use in training personnel to operate and maintain highly complex weapons and electronic systems. Citations have been included for reports cataloged by ASTIA from 1953 through 15 February 1962 and are arranged alphabetically by source. Within each source, reports published by Department of Defense contractors are listed alphabetically by contract and date; military reports are arranged alphabetically by title. Citations for periodical and journal literature, books, dissertations, patents, and research grants are also listed alphabetically by author or title, covering the period from 1950 to the present.

AD-271 372 Div. 23
(TISTB/MS) OTS price $6.60

Personnel Lab., Aeronautical Systems Div., Lackland Air Force Base, Tex.
THE METHODS AND FOUNDATIONS OF JOB EVALUATION IN THE UNITED STATES AIR FORCE,
by Joseph M. Madden. Oct 61, 58p. incl. table.
(Proj. 7734)
(ASD TR 61-100) Unclassified report

DESCRIPTORS: (*Job analysis, *Bibliography, Air Force.) (Personnel, Classification.)

This report includes:
ANNOTATED BIBLIOGRAPHY OF JOB EVALUATION,
by M. Joyce Giorgia and Joseph M. Madden. 1961.

This report summarizes the history of job evaluation and gives a critical review of the technical literature as a background for the Air Force job evaluation plan. The Air Force plan is described with the rationale for each phase. A discussion of unsolved problems includes an outline of research needed to discover solutions of these problems. An Appendix lists a 200-item bibliography with abstracts. (Author)

AD-271 483 Div. 23
(TISTB/MS) OTS price $2.25

Psychological Research Associates, Inc., Arlington, Va.
SELECTION OF TRAINING MEDIA.
Rept. for July-Dec 60, on Human Factors in the Design of Training Equipment,
by James F. Parker, Jr. and Judith E. Downs.
Sep 61, 94p. incl. illus. table.
(Contract AF 33(616)5738, Proj. 1710)
(ASD TR 61-473) Unclassified report

DESCRIPTORS: (*Training, *Military training, *Selection of Training devices, Effectiveness.) (*Job analysis, Aviation personnel.)

The selection of training media in support of military training programs represents an important area of concern. Training equipment exercises considerable influence on the way in which training programs are conducted, upon their effectiveness in accomplishing objectives, and upon the total cost of the program. This report is designed to assist a training analyst faced with the problem of selecting specific training aids and devices to be used in support of the development of the personnel subsystem of a military system. The translation of statements of desired personnel performances and capabilities, as presented in Qualitative and Quantitative Personnel Requirements Information and task analysis documents, into training objectives is discussed. The effectiveness of various training media in meeting specific training objectives is indicated and justified in terms of available objective evidence. An example is presented illustrating the manner in which training media are selected in support of a typical Air Force operator position. (Author)

24. PHOTOGRAPHY AND OTHER REPRODUCTION PROCESSES

AD-271 591 Div. 24
(TISTA/VGW) OTS price $1.60

Fairchild Camera and Instrument Corp., Syosset, N. Y.
QRC 183 (T) F-415A CAMERA SYSTEM.
Progress rept. no. 2.
1962, 10p. incl. illus.
(Contract AF 33(657)7759)
Unclassified report

DESCRIPTORS: (*Wide field cameras, *Aerial cameras, Prisms (Optics), Panoramic scanners for Aerial reconnaissance, Design, Effectiveness.)

Development is reported of the F-415A rotary prism panoramic camera. The F-415A has been optimized for achieving photographic coverage, horizon to horizon, of an area while operating at a minimum of 500 feet above the terrain at an airspeed of 600 knots. The stereoviewing capability is maintained by obtaining a sixty percent overlap of succeeding frames of photography. The F-415A has, as a design objective, a dynamic resolution of 20 lines per millimeter. (Author)

25. PHYSICS

AD-270 906 Div. 25, 4
(TISTM/GEC) OTS price $8.10

Hammond Metallurgical Lab., Yale U., New Haven, Conn.
DISLOCATIONS AND GLIDE IN SINGLE CRYSTALS OF LEAD SULFIDE AS A FUNCTION OF DEVIATION FROM STOICHIOMETRY AND DOPING ADDITIONS,
by Wilbur M. Franklin and J. Bruce Wagner, Jr.
19 Dec 61, 1v. incl. illus. tables, 42 refs.
(Technical rept. no. 5)
(Contract Nonr-60934)
Unclassified report

DESCRIPTORS: (*Lead compounds, *Sulfides, *Single crystals, Growth, Chemical impurities, Silver compounds, Crystal structure, Lattices, Deformation, Plasticity, Density.) (Fracture (Mechanics), Reaction kinetics, Stresses, Prisms, Polarization, Mechanical properties.) Microphotography.

The dislocation density determined by an etch pit technique in single crystals of PbS revealed a small but reproducible variation in density with deviation from the stoichiometric composition. The results were consistent with the theory of the contribution of atomic defects to total dislocation length. Higher defect concentrations gave higher dislocations densities. The rate of growth of dislocation etch pit width in single crystals of PbS and Ag doped PbS was not affected greatly by deviations from stoichiometric composition of doping with Ag but was affected significantly by equilibration temperature. Utilizing a prismatic punch technique, the critical stress to initiate glide by pushing a prism of material through (100) cleaved samples was related to deviation from the stoichiometric composition in the pure compound PbS and in Ag doped PbS. Specimens having greater defect concentrations, excess Pb or excess S, required higher stress to deform than specimens of the stoichiometric composition. (Author)

AD-270 919 Div. 25
(TISTP/WH) OTS price $1.60

Cornell U., Ithaca, N. Y.
K X-RAY FLUORESCENCE YIELD OF ARGON,
by Takeshi Watanabe, H. W. Schnepper and F. N. Cirillo. 19 Dec 61, 8p. illus. table (Research rept. no. 10)
(Contract AF 49(638)402)
(AFOSR-1932) Unclassified report

DESCRIPTORS: (*Argon, *X-ray spectrum, *Fluorescence, Measurement, Pulse height analyzers, Atomic structure.) (Radioactive isotopes, Iron.)

Reported values of the K x-ray fluorescence yield of argon lie in two distinct groups, low values (about 7%) and high values (about 13%). A new measurement is reported which gives 14 plus or minus 1.4%. This measurement is made from the escape peak in the pulse-height-distribution of a flow proportional counter with monochromatic x-rays. A Fe-55 radio-isotope was used as the source of primary x-rays. Corrections were made for the L and M ionizations, for the reabsorption of the K fluorescent x-rays, and for background counts. (Author)

AD-270 922 Div. 25
(TISTP/TL) OTS price $.50

National Aeronautics and Space Administration, Washington, D. C.
THE DESIGN AND OPERATION OF A CONTINUOUS-FLOW ELECTRODELESS PLASMA ACCELERATOR,
by. R. L. Barger, J. D. Brooks and W. D. Beasley.
Feb 62, 15p. incl. illus. 13 refs. (NASA Technical note D-1004)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical note D-1004.

DESCRIPTORS: (*Plasma physics, *Particle accelerators, Design, Gases, Gas flow, Ionization, *Magnetohydrodynamics, *Supersonic flow.) (Velocity, Measurement.) (Argon, Mercury, Vapors, Alternating current, Direct current, Pressure, Electric arcs, Glow discharges, Cathodes.) (High temperature research, Electromagnetic fields, Thermodynamics, Magnetic fields.)

A continuous-flow induction plasma accelerator utilizing argon, or argon seeded with mercury vapor, has been built and operated. Comparison of this alternating-current system with a previous investigation of a direct-current (d-c) accelerator indicated that the induction system is more effective at pressures below 1 mm Hg. Vane-deflection measurements indicated that there was an effective pumping action on the neutral gas. (Author)

AD-270 935 Div. 25, 9
(TISTP/TL) OTS price $1.60

Space Sciences Lab., General Electric Co., Philadelphia, Pa.
HYPERVELOCITY STAGNATION POINT HEAT TRANSFER,
by Sinclaire M. Scala and Walter R. Warren.
Oct 61, 9p. illus. 7 refs. (Rept. no. TIS R61SD185)
(Contract NASr-32)
Unclassified report

DESCRIPTORS: (*Heat transfer, *Hypersonic flow, *Hemispherical shells.) (Shock tubes, Shock waves, Plasma physics, Gases, Gas ionization, Air, Dissociation, Electric discharges, Laminar boundary layer, Transport properties, Particles, Diffusion.) (Atmosphere entry, Satellite vehicles, Re-entry vehicles.)

The results of a new theoretical analysis of the effects of ionization on hypervelocity stagnation point heat transfer, and experimental data obtained in a newly developed hypervelocity shock tube are presented for flight conditions ranging from orbital to superorbital velocities, and compared with existing theories. On the basis of the new theoretical results and the experimental data, it appears that the convective heat transfer rate encountered by a re-entry space vehicle entering the earth's atmosphere at escape velocity is more than twice as large as predicted by existing theories. (Author)

AD-270 950 Div. 25, 14
(TISTM/GEC) OTS price $2.60

Material Lab., New York Naval Shipyard, Brooklyn.
THERMAL RADIATION STUDIES.

Progress rept. no. 10, Jan-June 55,
by T. I. Monahan. 21 Sep 55, 29p. refs. (Lab. Projs. 5046-2, 5046-3, progress rept. no. 10)
(AFSWP-855) Unclassified report

DESCRIPTORS: (*Thermal radiation, Production, *Radiation effects, Materials, Bibliography.) (Skin, Simulation, Tests.) Laboratory equipment.

Contents:
Development of laboratory sources of intense thermal radiation
Laboratory evaluations of materials
Effect of source and material parameters on thermal damage to materials
Development of protective measures

AD-270 952 Div. 25, 30
(TISTM/GEC) OTS price $1.60

Material Lab., New York Naval Shipyard, Brooklyn.
A MEANS OF MONITORING LABORATORY EXPOSURES TO INTENSE THERMAL RADIATION IN ACCORDANCE WITH THE GENERALIZED FIELD PULSE.
Final development rept.,
by Jefferson A. Carter. 10 Feb 55, 10p. illus. 1 ref. (Lab. Proj. 5046-2, pt. 12)
(AFSWP-843) Unclassified report

DESCRIPTORS: (*Infrared pulses, *Thermal radiation, Atomic bomb explosions, Simulation, Generators, Design.)

To predict the behavior of organic materials, when exposed to a nuclear detonation, a laboratory source in which the irradiance is monitored in accordance with the normalized variation of intensity of irradiation with time for a nuclear detonation was designed and tested. (Author)

AD-270 957 Div. 25, 4
(TISTM/EJH) OTS price $1.10

Institute for Molecular Physics, U. of Maryland, College Park.
POTENTIAL CURVES FOR BeH(+) AND CH(+),
by Shirley M. Read, Joseph T. Vanderslice, and Frantisek Jenc. 12 Dec 61, 6p. incl. illus. tables, 10 refs. (Technical rept. no. 4)
(Contract Nonr-59514; In cooperation with Institute of Organic Chemistry and Biochemistry, Czechoslovakian Academy of Science, Praha, Czechoslovakia)
Unclassified report

DESCRIPTORS: (*Quantum mechanics, Electron transitions, Molecules, Ions, *Hydrides, *Beryllium compounds, *Carbon compounds, Methanes, Energy, Theory, Mathematical analysis.)

The Rydberg-Klein-Rees (RKR) method affords a convenient and reliable procedure for obtaining potential curves directly from the spectroscopic data. RKR curves were calculated for CH(+) and BeH(+) ions. The RKR results for BeH(+) are compared with the results of the recent quantum calculations (Jenc, F., Doctoral Dissertation Inst. of Organic Chemistry and Biochemistry, Czechoslovakia Academy of Science, Praha, 1962). The agreement between the calculated and experimental curves in the case of BeH(+) is roughly what it is in the case of LiH (Fallon, R. J., Vanderslice, J. T., and Mason, E. A., J. Chem. Phys. 32:1453, 1960; 33:944, 1960). (Author)

AD-270 969 Div. 25, 17
(TISTP/WH) OTS price $1.10

Brown U. Div. of Applied Mathematics, Providence, R. I.
EFFECTS OF ANGLE OF INCIDENCE IN AXIAL ATTACK,
by G. F. Carrier. Mar 55, 7p. incl. illus. 2 refs. (Technical memo. no. A11-TM/1)
(Contract N7onr-35801, Proj. NR 041-406)
(AFSWP 918) Unclassified report

DESCRIPTORS: (*Structural shells, Elastic shells, Cylindrical bodies, *Load distribution, Loading.) (Structural shells, Deformation, Deflection, Sound, Acoustics, Shock waves.) (Stresses, Mathematical analysis.)

AD-270 992 Div. 25, 8
(TISTM/BRW) OTS price $5.50

New York State Coll. of Ceramics, Alfred U.
SEMICONDUCTING MATERIALS.
Annual rept., Dec 60-Nov 61,
by Thomas J. Gray, G. I. Post and others.
Nov 61, 50p. incl. illus. tables, 15 refs.
(Contract Nonr-150301, Proj. NR 015-215)
Unclassified report

DESCRIPTORS: (*Semiconductors, Preparation, Single crystals, Crystals, Cadmium compounds, Zinc compounds, Lead compounds, Tellurides, Bismuth compounds, Selenides, Boron compounds, Phosphides, Photoconductivity, Thermoelectricity, Measurement, Hall effect, Resistance, Cooling, Growth.)

AD-270 999 Div. 25
(TISTP/WH) OTS price $4.60

Raytheon Co., Waltham, Mass.
MICROWAVE ABSORPTION IN CUBIC STRONTIUM TITANATE.
Scientific rept. no. 2 on Investigation of the Microwave Properties of Ferroelectrics,
by B. D. Silverman. Dec 61, 41p. incl. illus. 16 refs. (Rept. no. S-374)
(Contract AF 19(604)8005)
(AFCRL-1123) Unclassified report

DESCRIPTORS: (*Strontium compounds, Titanates, Temperature, *Microwaves, Absorption, Attenuation.) *Ferroelectric materials.

An analysis of the temperature dependence of the microwave loss in SrTiO3 is presented using the linear chain model of a ferroelectric as a basis for discussion. A plausible explanation of the temperature dependence of the microwave loss tangent above liquid air temperature is possible if one considers the loss to be due to the damping of a virtual excitation out in the wing of a fundamental lattice absorption. (Author)

AD-271 009 Div. 25, 17
(TISTM/TCG) OTS price $1.60

Syracuse U., N. Y.
CRACK INITIATION IN METALLIC MATERIALS.
Quarterly progress rept. no. 2, 1 Aug-1 Nov 61,
by Volker Weiss, John Sessler, and others.
Nov 61, 9p. incl. illus. tables, 6 refs.
(Contract NOw 61-0710-d)
Unclassified report

DESCRIPTORS: (*Fracture (Mechanics), *Metals, *Alloys, *Titanium alloys, Aluminum alloys, Vanadium alloys, Stresses, Deformation, Propagation, Grains (Metallurgy), Metallurgical analysis, Theory.)

An experimental program on Ti-2.5Al-16V speci-

neas, provided with fatigue cracks and subsequently aged to an extremely brittle condition at 700F for 4 hr, was conducted to test the feasibility of determining crack initiation based on the shallow notch equation by Neuber (Kerbspannungslehre, Springer-Verlag, 1958). (Author)

AD-271 029 Div. 25
(TISTP/TL) OTS price $4.60

Colorado U., Boulder.
TABLE OF ROTATIONAL TRANSITION STRENGTHS FOR ASYMMETRIC ROTATORS.
Supplement A to quarterly progress rept. no. 2, on Millimeter Wave Transitions for Frequency Control, 11 Sep-10 Dec 61,
by Burnell West and Masataka Mizushima.
10 Dec 61, 5p. tables, 4 refs. (Supplement A to quarterly progress rept. no. 2)
(Contract DA 36-039-sc-87277)
Unclassified report

DESCRIPTORS: (*Tables, *Microwave spectroscopy, Rotation, Resonance, Frequency, Control, Microwaves.) (Algebra, Theory, Integral equations, Matrix algebra, Dipole moments, *Quantum mechanics.)

AD-271 067 Div. 25, 17, 30
(TISTM/BRW) OTS price $ .75

Metals Research Lab., Brown U., Providence, R. I.
ULTRASONIC METHODS FOR THE STUDY OF STRESS CYCLING EFFECTS IN METALS.
Rept., Dec 59-Dec 60 on The Chemistry and Physics of Materials,
by Rohn Truell, Bruce Chick and others. Apr 61, 23p. incl. illus. 7 refs.
(WADD TR 60-920)
(Contract AF 33(616)6945, Proj. 7360)
Unclassified report

DESCRIPTORS: (Aluminum alloys, *Fatigue (Mechanics), *Ultrasonics, Ultrasonic properties, Attenuation, Velocity, Measurement.) (Stresses, Surfaces, Simulation, Microscopy, Electron microscopy, Test methods, Test equipment.) Lattices, Deformation, Alloys.

The use of ultrasonic methods for studying defect formation and its consequences in connection with stress cycling and fatigue of Al are discussed. The measurement of changes of ultrasonic attenuation and velocity during stress cycling are shown with the accompanying changes in the metallographic character of the surface sample as determined by acetate replicas and optical methods as well as oxide replicas and electron micrographs. The results, especially in the very early stages of stress cycling, support the ideas that the cycling is accompanied by a dying out of dislocation damping effects, including recovery, as the result of the immobilization of the dislocation oscillation by slip processes together with the increase in scattering caused by the development of defects and strain regions accompanying further slip. It has become quite clear that further advances in this area of work will require the study of high purity Al and singly crystal Al. The creation and improvement of equipment for the automatic recording of attenuation and velocity changes was a major part of the effort and a discussion of this equipment is presented. (Author)

AD-271 098 Div. 25
(TISTP/GRW) OTS price $4.60

Duntley, S. Q., La Jolla, Calif.
AN INSTRUMENT FOR THE MEASUREMENT OF THE VOLUME ABSORPTION COEFFICIENT OF HORIZONTALLY STRATIFIED WATER,
by John E. Tyler. Feb 60, 26p. tables, 6 refs.
(Rept. no. 3-4)
(Contract NObs-72039, Proj. NS 714-100)
Unclassified report

DESCRIPTORS: (*Light, *Absorption, Water, Determination, Instrumentation, Measurement, Oceans, Lakes.) (Recording devices, Data processing systems.) (Phototubes, Instrumentation.) (Underwater photography, Underwater television systems.) Photoelectric transducers.

The discussion of the problem of developing instrumentation for the determination of the absorption coefficient is divided into three parts: (1) the development of a suitable probe for simultaneously measuring and reporting the quantities required for the determination of the absorption coefficient, (2) the selection or development of photoelectric transducers with optical coupling which will produce signals proportional to the required optical quantities, and (3) the selection or development of methods for recording and processing the data to obtain the volume absorption coefficient. (Author)

AD-271 100 Div. 25
(TISIP/EH) OTS price $1.00

Armed Services Technical Information Agency, Arlington, Va.
MASERS AND LASERS. AN ASTIA REPORT BIBLIOGRAPHY, comp. by Elizabeth H. Hall. 1 Feb 62, 361 refs.
Unclassified report

DESCRIPTORS: *Masers, *Bibliography, *Microwave amplifiers, *Frequency stabilizers, USSR, Electronics, Scientific research, *Ruby, *Paramagnetic resonance, Cryogenics, Parametric amplifiers.

This bibliography was prepared in response to frequent inquiries concerning Masers and Lasers. Citations are included for documents cataloged by ASTIA from 1955 through 1 February 1962, and is restricted to unclassified, unlimited references. The classified section of the bibliography appears separately as a secret document identified as AD-327 894. References are arranged alphabetically by subject areas pertaining to Iraser, Lasers, Masers, and Rasers; reports published by Department of Defense contractors are listed alphabetically by source, contract and date; military reports are arranged by source and title.

AD-271 102 Div. 25
(TISTP/GRW) OTS price $9.60

Georgia Inst. of Tech. Engineering Experiment Station, Atlanta.
AN INVESTIGATION OF TWO-PHASE THERMAL CONDUCTIVITY.
Final rept.,
by Clyde Orr, Jr. and Andrew McAlister.
22 Dec 61, 111p. incl. illus. tables, 28 refs.
(Contract DA 01-009-ORD-704, Proj. A-416)
(AROD rept. no. 2250.1)
Unclassified report

Division 25 - PHYSICS

DESCRIPTORS: (*Thermal conductivity, Particles, *Colloids, Experimental data.) (Colloids, Gels.) (Greases, Zinc, Aluminum.)

The thermal conductivity of two-phase systems, one phase dispersed uniformly throughout the other is considered. Three types of dispersions - suspensions (solid particles suspended in a liquid), emulsions (liquid droplets distributed throughout an immiscible liquid), and powder beds (solid particles resting one upon another with a gas filling the interstitial spaces) - - were investigated. Previous investigations, equipment information, test procedures, experimental results, and a discussion of results as they relate to theoretical developments and practical uses are included. (Author)

AD-271 151 Div. 25, 15, 17
(TISTP/TL) OTS price $2.60

Massachusetts Inst. of Tech., Cambridge.
THE VARIANCE ON PALMGREN-MINER DAMAGE DUE TO RANDOM VIBRATION,
by Stephen H. Crandall, William D. Mark and Ghassan R. Khabbaz. Jan 62, 20p. illus. 4 refs.
(Contract AF 49(638)564)
(AFOSR-1999) Unclassified report

DESCRIPTORS: (*Metals, *Cantilever beams, *Fatigue (Mechanics), *Vibration, *Shear stresses, Loading, Deformation, *Load distribution.) (Time, Materials, Frequency, Damping, Oscillation.) (Probability, Statistical distributions, Statistical functions, Harmonic analysis, Statistical processes, Geometry, Integration, Differential equations, Integral equations, Numerical analysis, Sequences.)

A random stress-history which is proportional to the stationary response of a single-degree-of-freedom vibratory system to wide-band Gaussian excitation is assigned a damage based on the Palmgren-Miner hypothesis and an idealized S-N law. The damage accumulated in time T is a random variable because of the randomness in the number of cycles and the randomness in the amplitudes of the cycles. The mean and variance of the damage are obtained by two procedures: one which accounts for both sources of randomness and one which neglects the randomness in the number of cycles contained in the interval. The two procedures give the same asymptotic result when the bandwidth shrinks to zero. (Author)

AD-271 157 Div. 25, 8
(TISTE/REB) OTS price $1.60

Antenna Lab., Ohio State U., Research Foundation, Columbus.
ION SHEATH RESEARCH.
Annual summary rept., 1 Nov 60-31 Oct 61, by Ross Caldecott. 1 Nov 61, 11p. incl. illus. 8 refs. (Rept. no. 1021-12)
(Contract AF 33(616)6782, Projs. 1630-4427 and 1670-4062)
Unclassified report

DESCRIPTORS: (*Plasma physics, Hypersonics, Hypersonic flow, Theory, Electromagnetic waves, *Wave transmission, Antennas, Dipole antennas, Slot antennas, Test facilities, Hypersonic wind tunnels, Shock tubes.)

A continuing program of research on problems connected with the hypersonic plasma sheath is described. A number of basic theoretical problems are being studied, a series of missile borne experiments is in progress, and special laboratory test facilities including a shock tube and hot-shot wind tunnel have been developed. (Author)

AD-271 158 Div. 25, 8
(TISTP/WH) OTS price $2.60

Antenna Lab., Ohio State U. Research Foundation, Columbus.
ON THE FAR INFRARED EMISSION BY A NITROGEN PLASMA.
Rept. on Ion Sheath Research,
by Robert V. DeVore. 15 Jan 62, 21p. incl. illus. tables, 13 refs. (Rept. no. 1021-11)
(Contract AF 33(616)6782, Projs. 1630-4427 and 1670-4062)
Unclassified report

DESCRIPTORS: (*Infrared radiation, Molecules, Nitrogen, Ions, *Plasma physics.) (Nitrogen, Molecules, Molecular structure, Oscillation.) (Infrared research, *Infrared communication systems.) (Quantum mechanics, Electromagnetic waves.)

The important far infrared emission processes for hot nitrogen are listed and the possibilities of a pure rotational band occurring for the nitrogen molecular ion are considered in some detail. The approximations inherent in the quantum mechanical model are stated and the resulting emission by that model is considered. The molecular orbital model is considered next. The charge distribution resulting from this model is found to be highly symmetrical for all low-lying electronic states. Both models predicted negligible band emission. Consequently, the significant far infrared emission of nitrogen appears to be solely that of the continuum radiation processes. (Author)

AD-271 164 Div. 25, 8
(TISTP/JW) OTS price $14.50

Applied Physics Lab., Johns Hopkins U., Silver Spring, Md.
THE EQUIANGULAR SPIRAL ANTENNA ON A PLANE OR ARBITRARY SURFACE OF REVOLUTION,
by B. Storm. Mar 61, 204p. incl. illus. (Rept. no. CM-995)
(Contract NOrd-7386)
Unclassified report

DESCRIPTORS: (*Antenna radiation patterns, Design, Conical antennas, Helical antennas.) (Impedance, Surfaces, Motion.)

An approximate theory is developed for the calculation of the characteristic impedance and radiation properties of the equiangular spiral antenna on a plane or arbitrary surface of revolution. (Author)

AD-271 170 Div. 25, 9, 27, 20
(TISIP/MFA) OTS price $2.75

Armed Services Technical Information Agency, Arlington, Va.
PLASMA PHYSICS AND MAGNETOHYDRODYNAMICS. AN

ASTIA REPORT BIBLIOGRAPHY,
comp. by M. F. Aukland. 5 Mar 62, 135p.
1350 refs.

Unclassified report

DESCRIPTORS: *Plasma physics, *Magnetohydrodynamics, *Bibliography, Plasma jets, Plasma oscillations, Re-entry aerodynamics, Atmosphere entry, Instrumentation, Electromagnetic waves, Shock waves, Microwaves, Gas ionization, Magnetic pinch, Propellants, Propulsion.

This bibliography was prepared by ASTIA in response to requests for information concerning both general and specific aspects of plasma physics and magnetohydrodynamics. The citations presented cover the period from 1953 to early 1962 which coincide with the period of greatest development in these fields. Although many references may be related to more than one category, they appear only once in the bibliography under the subject area best indicated in the report. In addition to the general references on theory, analysis and instrumentation, entries have been included which cover the specific subject areas of electron-ion collisions, electromagnetic waves, gas ionization, magnetic pinch effects, microwaves, miscellaneous, plasma jets, plasma sheaths, propellants and propulsion, oscillations, nuclear applications, re-entry aerodynamics, shock waves and shock tubes, and solar and extraterrestrial effects. A classified volume of this bibliography appears as AD-327 800. Entries are arranged alphabetically by subject and by AD number within each subject.

AD-271 171 Div. 25
(TISTP/JW) OTS price $10.50

Aeronutronic, Newport Beach, Calif.
THE INFRARED ABSORPTION OF CARBON DIOXIDE.
Final rept., vol. 2 on Theoretical Study of the Infrared Radiative Behavior of Flames,
by V. R. Stull, P. J. Wyatt, and G. N. Plass.
30 Dec 61, 139p. incl. tables, 20 refs. (Publication no. U-1505)
(Contract AF 19(604)7479, Proj. 5043)
(AFCRL-62-210, vol. 2) Unclassified report

DESCRIPTORS: (*Carbon dioxide, *Radiation tolerance, Transmission, Behavior.) (*Flames, Intensity, Absorption.) (Statistical analysis, Tables.)

The infrared absorption of carbon dioxide was calculated over a wide range of path length and pressure from 1/500 to 1/10,000 cm. The results are presented in extensive tables which give the transmission over intervals of 1/5 cm and also averaged over larger intervals. The calculated data representing the intensity, position, and number of spectral lines in a given frequency interval is tabulated in a form which is useful for further transmission calculations. All lines from all isotopic species having an intensity greater than 1/10 to the 8th power of the strongest line in an absorption region were included in the calculation. The transmission values were calculated from the quasi-random model which stimulates the actual frequency and intensity distributions of spectral lines better than previous models. (Author)

AD-271 181 Div. 25
(TISTP/MFA) OTS price $9.10

Illinois U., Urbana.
EXCITONS AND PLASMONS IN SUPERCONDUCTORS, PART I.
LIFETIME EFFECTS IN CONDENSED FERMION SYSTEMS, PART II,
by J. R. Schrieffer. Nov 61, 104p. incl. illus.
28 refs. (Technical rept. no. 1)
(Contract AF 49(638)882)
(AFOSR-2045)

Unclassified report

DESCRIPTORS: (*Superconductors, Superconductivity.) (*Quantum statistics, Calculus of variations, Matrix algebra.) (*Electromagnetic theory, Particles, Electrons, Phonons, Excitation, Relaxation time, Paramagnetic crystals.) (Equations of Energy and Motion, Harmonic analysis.) Solid state physics, Theses.

The exciton mode in the superconductor as a bound pair of quasi-particles whose center-of-mass propagates with a certain momentum is discussed. The exciton spectrum is investigated through generalized equations of motion involving the quasi-particle operators of Bogoliubov and Valatin rather than ck, the usual electron operators. In these equations an expansion of the interaction potential in terms of spherical harmonics is presented. It is found that excitons may be characterized by the approximate quantum numbers L and M describing the symmetry of the states with respect to the relative coordinates. The existence of an L-state exciton (corresponding to the p,d,f,...excitons) is dependent on VL being negative, where VL is the L-wave part of the interaction potential. The plasmon state corresponds to an s-state exciton whose energy is greatly increased by the long-range Coulomb interaction. (Author)

AD-271 370 Div. 25
(TISTM/EJH) OTS price $1.60

Uppsala U. (Sweden).
RATIONAL APPROXIMATION OF DECAY-TYPE FUNCTIONS,
by Klaus Appel. 1 Oct 61, 14p. incl. illus.
(Technical note no. 66)
(Contract AF 61(052)351)
(ARL-229) Unclassified report

DESCRIPTORS: (Radioactive decay, *Electron transitions, *Quantum mechanics, *Programming, Mathematical analysis, Least squares method, Polynomials.)

Numerically given functions with exponential asymptotic behavior are approximated by rational expressions. The numerators are obtained from the nodes of the functions, and the denominators are powers of polynomials, whose coefficients are obtained by expansion in orthogonal polynominals. Different weights are discussed for uniform absolute or relative errors. An iterative procedure is further described to improve the least-squares approximation to one of Chebyshev-type best fit. (Author)

AD-271 376 Div. 25
(TISTP/JW) OTS price $5.60

Applied Physics Lab., Johns Hopkins U., Silver Spring, Md.
THEORETICAL ANALYSIS OF THE FLOW AND DRAG OF SURFACE IRREGULARITIES IMMERSED IN A WALL-LAYER STREAM IN A SUPERSONIC MAIN STREAM,
by Henry W. Woolard. Oct 61, 44p. illus. 21 refs.
(Rept. no. TG-425)
(Contract NOrd-7386)

Unclassified report

Paper presented at the U. S. Navy Symposium on Aeroballistics. Naval Ordnance Lab., White Oak, Md., October 16, 17, and 18, 1961.

DESCRIPTORS: (Boundary layer, *Fluid flow, Drag, Surface properties.) (*Wave characteristics, Subsonic flow, Compressible flow, *Mach number, Supersonic flow.)

A two-dimensional inviscid compressible flow over an arbitrarily shaped surface irregularity immersed in single or double wall-layer streams parallel to a supersonic main stream is analyzed. Solutions for single-layer streams are obtained on a linearized two-dimensional basis for the complete flow field. Solutions for double-layer streams are obtained on a linearized quasi one-dimensional basis for the layer streams and on a linearized two-dimensional basis for the main stream. The double-layer stream is considered as an idealization of a boundary layer, and has possible application to the determination of the influence of a boundary layer on the wave drag of a surface irregularity submerged in the boundary layer. Comparison of pressure distributions and wave-drag calculations by the quasi one-dimensional method with limited experiments is not completely satisfactory for dominantly subsonic layer streams, but holds promise for turbulent boundary layers for Mach numbers around 2.0 and higher. (Author)

AD-271 385 Div. 25, 14
(TISTM/BRW) OTS price $1.10

Carborundum Co., Niagara Falls, N. Y.
A STUDY OF FUNDAMENTAL MECHANICAL PROPERTIES OF CERAMIC SINGLE CRYSTALS.
Bi-monthly rept. no. 4, 12 Nov 61-11 Jan 62, by H. Dean Batha. 23 Jan 62, 2p. illus. 1 ref.
(Contract NOw-61-0676-c)
Unclassified report

DESCRIPTORS: (*Single crystals, *Ceramic materials, *Magnesium compounds, Oxides, Silicon compounds, Carbides, Preparation, Growth, Mechanical properties, Tests.) (Fracture (Mechanics), High temperature research, Stresses, Deformation, Shear stresses, Plastic flow.) (Ultrasonics, Cutting tools, Test equipment.)

The three-point bending apparatus for obtaining stress-strain curves is assembled and preliminary testing is underway. Preliminary measurements on MgO crystals were made and appear to be in agreement with literature values. Apparatus for cutting single crystals of SiC was built and tested. (Author)

AD-271 392 Div. 25
(TISTP/TL) OTS price $1.60

Illinois U., Urbana.
LIFETIME OF THE EXCITED F-CENTER,
by Robert K. Swank and Frederick C. Brown.
Nov 61, 9p. illus. 6 refs. (Technical note no. 9)
(Contract AF 49(638)579)
(AFOSR-1842) Unclassified report

DESCRIPTORS: (*Alkali metal compounds, *Halides, *Crystals, *Crystal structure, Excitation, Photoconductivity, Measurement.) (Fluorescence, Luminescence, Life expectancy, Pulse height analyzers, L band, Relaxation time.) (Potassium compounds, Chlorides, Bromides, Iodides.)

Because of the strong absorption of the F-band in alkali halide crystals, it was assumed that the radiative lifetime of the excited state would be of the order of that for an allowed atomic transition. It is the purpose of this analysis to report direct measurements of this lifetime, showing that it is of the order of 10 to the -6 power/sec. It also will be shown how measurements of photoconductivity, luminescence, and lifetime may be used to obtain interesting information about the excited states of the F-center. (Author)

AD-271 393 Div. 25
(TISTM/GEC) OTS price $5.60

Illinois U., Urbana.
MAGNETORESISTANCE OF THE SILVER HALIDES,
by Harry H. Tippins, Jr. Dec 61, 50p. incl. illus. 31 refs. (Technical note no. 10)
(Contract AF 49(638)579)
(AFOSR-2040) Unclassified report

DESCRIPTORS: (*Silver compounds, *Bromides, *Chlorides, Crystals, Electrons, Magnetic fields, *Magnetic effects, *Conductivity, Photoelectrons, Resistance.) (Theory, Semiconductors, Metals, Photoconductivity, Hall effect.) Test methods, Test equipment. *Halides.

A study was made of the effect of a magnetic field on the conductivity, i.e., the magnetoresistance effect. The detailed behavior of conduction electrons in a solid in the presence of external fields is determined primarily by two factors, the band structure of the material, and the scattering processes which the electrons experience. Comparison of experimental results with the theoretical predictions for various assumed band structures and scattering mechanisms could provide important evidence for the correct band structure and scattering to be associated with the particular material of interest. To obtain the full information available from electronic conduction measurements it was necessary to apply both electric and magnetic fields. (Author)

AD-271 417 Div. 25
(TISTP/TL) OTS price $1.60

General Atomic Div., General Dynamics Corp., San Diego, Calif.
CHARGE TRANSFER IN COLLISIONS INVOLVING SYMMETRIC AND ASYMMETRIC RESONANCE,
by R. F. Stebbings, A. C. H. Smith, and W. L. Fite.
5 Jan 62, 17p. incl. illus. 13 refs. (Rept. no. GA-2783)
(Contract Nonr-278600)
Unclassified report

Preprint of a paper submitted for publication in the Proceedings of the Royal Society, London.

DESCRIPTORS: (*Hydrogen, Atoms, *Oxygen, *Helium, *Heat transfer, *Scattering, Protons, *Atomic energy levels, Resonance.) (Ion beams, Photoelectric cells, Oscilloscopes, Electron guns.)

The cross sections for charge transfer in collisions between atomic hydrogen and O(+) and He(++) ions are presented. Unique interest attaches to these processes because they may occur with small or zero energy defect. Theoretical conflict exists regarding the magnitude and energy dependence of the cross sections for accidental resonance collisions; the present work was

prompted by the need for further information. Cross sections for symmetric resonance charge transfer between protons and atomic hydrogen are also presented for energies down to 20 eV. The experiments were carried out using the techniques of modulated crossed beams. (Author)

AD-271 421 Div. 25, 4
(TISTM/EJH) OTS price $6.60

Georgia Inst. of Tech., Engineering Experiment Station, Atlanta.
X-RAY DIFFRACTION STUDIES OF THERMAL MOTIONS IN CRYSTALS,
Annual rept. no. 3, 1 June 60-31 May 61,
by R. A. Young and R. M. Nicklow. 31 May 61, 62p. incl. illus. refs.
(Contracts Nonr-99100 and Nonr-99106, Proj. NR 016-623)
Unclassified report

DESCRIPTORS: (*Crystals, Single crystals, *Aluminum, *Silver compounds, *Sodium compounds, *Chlorides, X-ray diffraction analysis, Crystal structure, Temperature, High temperature research, Thermal expansion, Thermal diffusion, Theory.) (Test methods, Test equipment, X-ray filters.)

Research continued on the general study, primarily by x-ray intensity-vs-temperature (I vs T) measurements, of thermal motions in crystals and their interaction with other phenomena of interest in crystal physics. Critical re-examination of experimental techniques led to a better understanding of background intensities and subsequently to the solution of several persistent problems. A graphical method (curvature method) developed for comparing the temperature dependence of the normalized temperature slope of log I vs T, A(T), with the theoretical prediction, f(x), by means of log-log plots. Results indicate that the curvature method is sensitive to discrepancies between experimental observations and theory, and that the Debye-Waller theory does not adequately describe the temperature dependence of Bragg intensities for AgCl. Thermal expansion data for AgCl, NaCl, and Al in the 100 K to 300 K temperature range were obtained. The discrepancies found between theory and experiment indicate a breakdown in the simplified Mie-Gruneisen thermal expansion theory used, or the Debye lattice vibration theory, or both, for AgCl. (Author)

AD-271 422 Div. 25, 8
(TISTE/NTM) OTS price $3.60

General Electric Co., Syracuse, N. Y.
SOLID STATE MICROWAVE DELAY LINE.
Annual rept.
1961. 26p. incl. illus. 2 refs.
(Contract AF 30(602)2230)
(RADC TR 61-237)
Unclassified report

DESCRIPTORS: (*Delay lines, Microwave frequency, *Microwave equipment, *Solid state physics.) (Acoustics, *Solid delay lines, *Magnetostrictive elements, Transducers, Magnetostriction transducers.) (Microwaves, Propagation, Single crystals, Silicon, Germanium, Hypersonics, Attenuation.) (Piezoelectric effect, Quartz crystals, X band, Waveguides.) (Bonding, Semiconductors, Silicones, Greases, Cryogenics, Thin films.)

Some techniques for the construction of a microwave acoustic delay line were investigated. The problems of launching and detecting acoustic waves in the frequency range of 3 to 10 ghz were explored. The uses of quartz as a delay medium and as a transducer material were investigated. Propagation at 3 ghz and 10 ghz was demonstrated in single crystal silicon and propagation at 3 ghz was achieved in germanium. Also investigated were some techniques for bonding quartz to other materials, and a technique for terminating such a line mechanically. (Author)

AD-271 434 Div. 25, 20
(TISTP/JW) OTS price $4.60

Westinghouse Electric Corp., Pittsburgh, Pa.
STUDIES AND EXPERIMENTAL WORK ON ATOMIC COLLISION PROCESSES OCCURRING IN ATMOSPHERIC GASES.
Final rept.,
by A. V. Phelps and M. A. Biondi. 30 Oct 61, 43p. incl. illus. refs. (Research rept. no. 908-1902-R1)
(Contract AF 29(601)2790, Proj. 7811)
(AFSWC TR 61-91) Unclassified report

DESCRIPTORS: (Air, *Electrons, *Ions, *Oxygen, Atoms.) (Atmosphere, Electrical properties.) (Electrons, Drift, Measurement.)

Results of measurements of the collisional detachment of electrons from oxygen negative ions are presented. It is shown that the electron affinity of the negative O2 ion is 0.44 + or - 0.02 ev. A discussion of low pressure measurements is presented, where the product of the attachment coefficient and detachment frequency is determined from the ratio of the detached electron current to the current of electrons which cross the drift tube without attaching to the gas. A discussion of the high pressure technique is given in which the ratio of the detachment frequency to the attachment coefficient is obtained from measurements of the ion and electron drift velocity. A treatment of the attempt to assign an energy scale to drift tube data is presented. The present state of this field is briefly reviewed and recommendations for future work are made. (Author)

AD-271 469 Div. 25, 4
(TISTM/EJH) OTS price $8.10

Naval Ordnance Lab., White Oak, Md.
REFLECTIVITY AND OPTICAL CONSTANTS OF INDIUM ARSENIDE, INDIUM ANTIMONIDE, AND GALLIUM ARSENIDE,
by Robert E. Morrison. Nov 61, 81p. incl. illus. tables, 46 refs. (NOLTR 61-56)
Unclassified report

DESCRIPTORS: (*Semiconductors, *Indium compounds, *Gallium compounds, *Arsenides, *Antimonides, Intermetallic compounds, Optics, Reflection, Refractive index, Refractive properties, Light, Absorption, Mathematical analysis, Integral equations.) (Ultraviolet spectroscopy, Infrared spectroscopy, Spectrophotometers, Photomultipliers.)

The reflectivities of InAs, InSb, and GaAs were measured between 0 and 6.0 ev, and the optical constants were computed from these data, using the dispersion relation between the phase and the magnitude of the reflectivity. Near 2.5 and 5.0 ev, reflectivity peaks appear, the lower maxima splitting into 2 smaller peaks whose separations are 0.35 ev, 0.50 ev, and 0.20 ev, respectively, for the 3 materials. The imaginary part of the reciprocal of the dielectric constant, whose values at 6.0 ev are 1.0, 1.7, and 0.8, respectively, appears to have a maximum just beyond 6.0 ev. These values are uncertain because of the effect of extrapolating the reflectivity to energies above 6.0 ev. (Author)

AD-271 470 Div. 25, 17
(TISTP/TL) OTS price $1.60

Utah U., Salt Lake City.
HIGH-VELOCITY IMPACT STUDIES.
Final rept., 15 July 58-30 Sep 61, 31 Oct 61, 14p. (Technical rept. no. 24)
(Contract AF 49(638)462)
(AFOSR-1937) Unclassified report

DESCRIPTORS: (*Particles, *Pellets, *Hypersonics, Velocity, *Impact shock, Meteorology, Particle accelerators, *Metals.) (Satellite vehicles, Erosion.) (Pellets, Acceleration.) (Particles, Hydrogen, Atoms, Scattering, Copper, Argon.) Feasibility studies, Spectrographic analysis.

Contents:
Impact-flash and spray-particle investigation
Spectral analysis impact of copper spheres into copper targets
A laboratory investigation of meteor physics
Light-gas-gun development
Electrostatic acceleration of small particles
Impact and cratering investigations on steel and aluminum in space

AD-271 471 Div. 25, 1
(TISTP/JW) OTS price $1.60

Brown U. Div. of Applied Mathematics, Providence, R. I.
PLANE-STRAIN AND GENERALIZED PLANE-STRESS ANALYSIS OF A ROTATING VISCOELASTIC CYLINDER,
by J. Ignaczak. Feb 62, 18p. incl. illus. 6 refs.
(Technical rept. no. 4)
(Contract Nonr-56230, Proj. NR-064-450)
Unclassified report

DESCRIPTORS: (*Cylindrical bodies, Rotation, Elasticity, *Stresses, Viscosity.) (Boundary layer, *Fluid flow, Surfaces.)

The departure of the plane-strain from the generalized plane-stress solution is explored quantitatively in connection with a particular boundary-value problem in the special case of isothermal viscoelastic theory. The problem is that of a viscoelastic circular cylinder which rotates about its geometric axis. The corresponding angular velocity is assumed to be switched on instantaneously at some initial instant and is supposed to be constant thereafter. The solutions obtained are particularized to, and discussed numerically for, the Maxwell solid. It is found that the plane-strain and the generalized plane-stress values of the hoop stress at the periphery of the cylinder, which are relatively close to each other in the initial elastic state, diverge monotonically as time progresses. It is also found that the generalized plane-stress value of the radial displacement at the periphery of the cylinder tends to infinity with time, while the corresponding displacement in the plane-strain solution approaches a finite value in this limit. (Author)

AD-271 479 Div. 25
(TISTP/WH) OTS price $2.60

Institute for Fluid Dynamics and Applied Mathematics, U. of Maryland, College Park.
THE WAVE MOTIONS OF SMALL AMPLITUDE IN A FULLY IONIZED PLASMA, PART IV. WITH AN ARBITRARY APPLIED MAGNETIC FIELD,
by D. G. Weir. Jan 62, 22p. illus. 3 refs.
(Technical note no. BN-271)
(Contract AF 49(638)401, Proj. 9781)
(AFOSR-2144) Unclassified report

DESCRIPTORS: (*Plasma physics, Magnetic fields, Ions, Wave transmission, *Magnetohydrodynamics, Perturbation theory.)

AD-271 534 Div. 25
(TISTP/WH) OTS price $1.10

Brown U. Div. of Applied Mathematics, Providence, R. I.
ON A VARIATIONAL PRINCIPLE IN LINEAR VISCOELASTICITY.
by E. T. Onat. Jan 62, 8p. 9 refs. (Technical rept. no. 74; Rept. no. C11-74)
(Contract Nonr-56210, Proj. NR 064-406)
Unclassified report

DESCRIPTORS: (*Elasticity, Viscosity, *Solids, *Linear systems, Stresses, Deformation.) (Mathematical analysis, Stresses, Partial differential equations.)

Starting with an integral representation of the mechanical behavior there is developed a variational principle concerned with velocities in the quasi-static deformations of a linear viscoelastic body. A functional of the second degree which represents, according to the previous work based on model representation, the elastic energy stored in the body enters the present variational principle in a natural manner. (Author)

AD-271 559 Div. 25
(TISTM/EJH) OTS price $5.60

Radiation Lab., Johns Hopkins U., Baltimore, Md.
RELAXATION PHENOMENA IN DILUTE POTASSIUM FERRICYANIDE. PART II. A THEORETICAL AND EXPERIMENTAL INVESTIGATION OF RELAXATION EFFECTS IN $K_3(Fe, Co)(CN)_6$,
by T. M. Bray, G. C. Brown, Jr., and A. Kiel. Jan 62, 47p. incl. illus. tables, 24 refs.
(Technical rept. no. AF-90)
(Contract AF 33(616)6753)
Unclassified report

DESCRIPTORS: (*Paramagnetic crystals, Paramagnetic salts, *Potassium compounds, Cobalt compounds, *Iron compounds, *Cyanides, *Relaxation time, Nuclear spins, Temperature, Low temperature research, Spectrographic analysis, *Paramagnetic resonance. Theory.) Masers.

The measured spin-lattice relaxation times in $K_3(Co, Fe)(CN)_6$ are in agreement with the values calculated on the basis of the Van Vleck theory. Comparison of the results with similar measurements (Paxman, D. H. Proc. Phys. Soc. 78:180, 1961) at higher ferricyanide concentrations indicated a small concentration dependence at temperatures below 2.5 K. It was concluded that the Raman processes dominate the spin-lattice relaxation mechanism to lower temperatures in the more dilute crystals. The initial rapid decay of the saturated spin system observed in the relaxation curves was interpreted as a spin-diffusion process rather than cross-relaxation between adjacent resonance lines, since the effect was independent of the separation of these resonance lines. (Author)

AD-271 572 Div. 25, 17
(TISTM/BRW) OTS price $7.60

Minnesota U., Minneapolis.
PHENOMENOLOGICAL THEORIES OF HYSTERETIC MATERIAL DAMPING WITH APPLICATION TO THE VIBRATIONS OF CIRCULAR PLATES,
Rept. for Mar 60-June 61 on Metallic Materials, by J. S. Whittier. Nov 61, 67p. incl. illus. tables, 30 refs.
(Contract AF 33(616)6828, Proj. 7351)
(ASD TR 61-264) Unclassified report

DESCRIPTORS: (Structures, Materials, *Vibration, Hysteresis, *Damping, Theory, Stresses, Mathematical analysis.) (Disks, Beams, Cylindrical bodies, Spheres, Tests, Data.) (Metal plates, Steel, Brass, Copper, Magnesium alloys, Nickel alloys, Chromium alloys.) (Machines, Turbine blades, Ball bearings, Airplane panels.) Applied mechanics, Alloys.

Prediction of hysteretic specific damping energy of structural materials under combined dynamic stresses knowing the damping under uniaxial stresses is discussed. Consideration is limited to biaxial states of stress. Bounds for biaxial stress damping are proposed to be the values predicted by assuming purely dilatational damping and purely distortional damping. Available published data show qualitative agreement with the predicted bounds. New experiments for this report involving vibration decay tests on mild steel beams and circular plates are discussed with emphasis on accuracy. Data for beams are used to predict bounds for plate damping. Plate damping data are bracketed by these bounds which lends confidence in the theory for this sort of stresses. It is concluded that the theory will give satisfactory results for isotropic, homogeneous materials provided the biaxially-stressed part and the specimens for the uniaxial-stress damping experiments are from the same stock and the uniaxial tests match the temperature and frequency of the application. (Author)

AD-271 573 Div. 25, 30
(TISTA/VGW) OTS price $19.75

Gulton Industries, Inc., Metuchen, N. J.
INVESTIGATION OF SOLID STATE INSTRUMENTATION TECHNIQUES.
Rept. for May 60-Feb 61,
by Daniel S. Schwartz. Dec 61, 304p. incl. illus. tables, 98 refs.
(Contract AF 33(616)6359, Proj. 8224)
(WADD TR 61-9) Unclassified report

DESCRIPTORS: (*Solid state physics, *Transducers, Transistors in Oscillator circuits, *Piezoelectric effect in Dielectrics, Piezoelectric materials, *Piezoelectric transducers, Pressure gages, Heat transfer, Temperature sensitive elements, Ferrites, *Semiconductors, Pulse generators.)

Research into solid state transducing techniques was directed toward the measurement of pressure, acceleration, temperature, and heat flow. Areas of investigation were: unijunction transistors in oscillator circuits, piezocapacitive effects in high dielectric constant materials, mobility and diffusion effects in semiconductors, the direct and inverse piezoelectric effects, and a unidirectional temperature independent strain transducer. Preliminary investigations were carried out on previously proposed heat flow rate schemes, piezoresistive shear effects, the acoustoelastic effect, piezoresistance in Ga Sb, the piezoresistive effect at high temperatures, high dielectric constant materials for temperature measurement together with experimental evaluations of piezoresistive and piezocapacitive ceramic materials. Experimental unijunction transistors temperature probes have been fabricated and evaluated, and experimentation has been initiated on the digital and analog measurement of heat transfer rate utilizing mobility and diffusions effects in semiconductors and digital accelerometers utilizing the inverse piezoelectric effect. (Author)

AD-271 587 Div. 25, 4, 8, 14
(TISTE/GEC) OTS price $8.60

Naval Ordnance Lab., Corona, Calif.
FOUNDATIONAL RESEARCH PROJECTS.
Quarterly rept., July-Sep 61.
15 Dec 61, 95p. incl. illus. tables.
(NAVWEPS rept. no. 7205) Unclassified report

DESCRIPTORS: (*Telephone communication systems, Panel boards (Electricity), Noise generators, Theory, Design.) (*Ferromagnetism, *Iron alloys, *Nickel alloys, Films.) (*Rare gases, Infrared spectroscopy, Interferometers, Electromagnetic waves, Wave transmission.) (*Semiconductors, *Silicon, Magneto-optic rotation.) (*Heat resistant polymers, *Polymers, *Phosphines, Phenyl radicals, Chlorides, Synthesis, Chemical reactions.) (Solid state physics, *Microwave oscillators, *Diodes, *Rare earth compounds, Calcium compounds, Fluorides, *Thulium compounds, Spectrophotometers, Absorption, Fluorescence, Crystals.) (*Guided missile antennas, *Slot antennas, *Waveguide slots, Dielectrics, Antenna radiation patterns, Measurement.)

AD-271 606 Div. 25
(TISTP/FR) OTS price $2.60

Bolt, Beranek, and Newman, Inc., Cambridge, Mass.
A TEST OF THE 20-BAND AND OCTAVE-BAND METHODS OF COMPUTING THE ARTICULATION INDEX,
by K. D. Kryter, Gail Flanagan and Carl Williams.
Oct 61, 24p. incl. illus.
(Contract AF 19(604)4061)
(ESD TDR 62-4) Unclassified report

DESCRIPTORS: (*Speech, *Intelligibility, Measurement.) (Audiofrequency, Signal to noise ratio, Noise, Determination.)

The accuracy with which the Articulation Index is calculated by both the octave band and 20-band methods predict the intelligibility of speech presented to listeners in the presence of a variety of types of broad band noises was calculated. The results indicate that, for the noises tested, the octave band method for the calculation of articulation index can be used in place of the more detailed 20-band method without any appreciable loss in the accuracy with which speech intelligibility test scores are predicted. (Author)

AD-271 617 Div. 25, 7
(TISTP/WH) OTS price $7.60

Manhattan Coll., New York.
INVESTIGATION OF THE APPLICABILITY AND LIMITATIONS OF THE VARIOUS METHODS OF COMPUTING AMPLITUDES OF TORSIONAL VIBRATION IN WHICH ENGINE DAMPING IS OF PRIMARY IMPORTANCE.

Final rept., on Phase IV,
by Otakar Ondra and Sai-lung Pan. Dec 61, 78p. incl. illus. tables, 8 refs.
(Contract NObs-66160)
Unclassified report

DESCRIPTORS: (Vibration, *Torque, *Shafts, Damping.) (Internal combustion engines, Generators.) Numerical methods and procedures.

The applicability and limitations of various methods are investigated for computing amplitudes of torsional vibration in which engine damping is of primary importance. The investigation is limited to the direct-connected engine-generator type of internal-combustion installations. A generally poor correlation was found to exist between amplitudes of torsional vibration calculated by means of seventeen available formulae, and amplitudes determined by tests. Arbitrarily safer amplitude forecasts are possible if existing formulae are modified by introducing statistically determined coefficients. A new empirical formula, statistically evolved from test data, indicates a much improved reliability and accuracy of amplitude and maximum stress predictions. (Author)

AD-271 629 Div. 25, 8
(TISTP/FR) OTS price $5.60

David Sarnoff Research Center, Princeton, N. J.
SEMICONDUCTOR PHOTOVOLTAIC CONVERSION.
Final triannual rept., 1 Nov 60-31 Oct 61,
by J. J. Wysocki, J. A. Scott-Monck and others.
30 Nov 61, 53p. incl. illus. tables, refs.
(Contract DA 36-039-sc-87417, Proj. 3A99-21-001)
Unclassified report

DESCRIPTORS: (*Solar cells, Radiation damage, Tests.) (Silicon, *Gallium compounds, *Arsenides, *Phosphides, Chemical impurities, Phosphorus, Zinc, Boron, Indium, Gallium.) (Photons, Sun.)

The ultilization of semiconductor alloys is studied for the possible improvement of solar cell characteristics such as efficiency, high-temperature performance and radiation resistance. The theoretical studies of spectral response and its implications and the question of the radiation-resistant properties of solar cells, especially those made of silicon and GaAs are considered. An investigation will be made of the specific factors determining the radiation properties of n and p silicon solar cells with the ultimate aim of obtaining higher radiation-resistant cells. (Author)

AD-271 631 Div. 25
(TISTP/TL) OTS price $1.60

Israel Inst. of Tech., Haifa.
THE EFFECT OF AXIAL CONSTRAINT ON THE INSTABILITY OF THIN CIRCULAR CYLINDRICAL SHELLS UNDER UNIFORM AXIAL COMPRESSION,
by Josef Singer. Sep 61, 11p. illus. 6 refs.
(Technical note no. 4; TAE rept. no. 16)
(Contract AF 61(052)339)
(AFOSR-2028) Unclassified report

DESCRIPTORS: (*Cylindrical bodies, *Shear stresses, Elasticity, Loading, Deformation, Fatigue (Mechanics), Buckling, Stability, Analysis.) (Linear systems, Theory, *Differential equations, Geometry, Polynomials.)

The effect of axial elastic restrain on the instability of a circular cylindrical shell under uniform axial compression is analysed by a Rayleigh Ritz approach within the bounds of linear theory. The effect is calculated for a wide range of parameters and design curves are presented for the percentage increase in critical load. The analysis is carried out for restraints which are active from the beginning of loading and for such which come into action only at the onset of buckling. (Author)

AD-271 633 Div. 25, 8
(TISTM/GEC) OTS price $3.60

Sylvania Electric Products, Inc., Woburn, Mass.
INVESTIGATION AND DEVELOPMENT IN THE AREA OF EPITAXIAL GROWTH TECHNIQUES.
Quarterly rept. no. 2, 1 Sep-30 Nov 61,
by P. Wang, V. Sils, and R. Berkstresser.
30 Nov 61, 26p. incl. illus. tables.
(Contract NObsr-85431)
Unclassified report

DESCRIPTORS: (*Diodes, Silicon compounds, Silanes, Chlorides, Diffusion, Vapors, Deposits, *Thin films, Temperature, *Silicon, Crystals, *Single crystals, Growth, Thickness, Resistance.) (Chemical impurities, Phosphorus, Boron compounds, Bromides.) Gases, Argon.

The study of the effect of growth conditions on surface and crystal perfection of epitaxial deposited layer was continued. The limit of layer thickness control was determined for both the single and multi-slice setups. The dependence of growth rate on the furnace geometry and gas flow pattern was demonstrated. Growth rate versus substrate orientation was investigated under one set of conditions. Control of layer resistivity was demonstrated in $SiHCl_3$ system with P doped A and in a $SiCl_4$ system with BBr_3 doped $SiCl_4$ by the mixed vapor technique. A diffusion technique for the determination of layer doping impurity gradient was developed. The effect of substrate orientation on pn junction parameters was investigated. Comparison was made of single and multiple sources in the growth system. Study of passivation techniques for epitaxial diffused devices was undertaken. Samples of pn planar diodes made by epi-oxide masking and diffusion were submitted. (Author)

AD-271 639 Div. 25
(TISTM/EJH) OTS price $5.60

Theoretical Chemistry Lab., U. of Wisconsin, Madison.
TRANSPORT PROPERTIES OF GASES OBEYING THE MORSE POTENTIAL.
Rept. for 16 Sep-Dec 61,
by S. E. Lovell and J. O. Hirschfelder.
20 Dec 61, 50p. incl. illus. tables, 11 refs.
(Rept. no. WIS-AF-19, Series 5)
(Contract AF 33(657)7311)
Unclassified report

DESCRIPTORS: (*Gases, *Transport properties, Thermodynamics, Integral equations, Mathematical analysis.) *Tables.

The first six of the Chapman-Enskog collision integrals were calculated for gases obeying the Morse potential. Along with the collision integrals, certain commonly used ratios are tabulated for 42 temperatures (reduced) ranging from 0.1 to 200 and for 6 values of the free parameter in the potential. (Author)

26. PRODUCTION AND MANAGEMENT

AD-271 644 Div. 25
(TISTP/TL) OTS price $6.60

Sloane Physics Lab., Yale U., New Haven, Conn.
SYMMETRY PROPERTIES OF WAVE FUNCTIONS IN MAGNETIC CRYSTALS,
by J. O. Dimmock and R. G. Wheeler. 11 Jan 62, 29p. illus. tables, 19 refs.
(Contract AF 49(638)503)
(AFOSR-2056) Unclassified report

DESCRIPTORS: (*Crystals, Crystal structure, Magnetic properties, Paramagnetic crystals, Magnetic moments, Lattices, Quantum mechanics, *Brillouin zones, Solid state physics.) (Physical properties, Surface properties, Oxygen, Magnesium compounds, Fluorides, Oxides.) (Molecular rotation, Ferromagnetism, Magnetostriction.) (Ions, Perturbation theory, Vector analysis, Operators (Mathematics), Algebra, Theory, Functions, Tables.)

The symmetry properties of wave functions in magnetic crystals are discussed in terms of the irreducible representations of magnetic space groups. The specific effects of the magnetic ordering on the crystal eigenstates are of three types: (1) There is a lifting of some eigenfunction degeneracies because the crystal symmetry is reduced in the magnetic state; (2) New Brillouin zone surfaces are introduced if there is a reduction in translational symmetry; (3) The symmetry of the energy band in K-space may be reduced. The rutile structure is considered as a specific example and the space groups of MnF2 and MnO2 in their magnetic and nonmagnetic states are obtained. (Author)

AD-271 648 Div. 25, 2
(TISTP/GRW) OTS price $12.50

Queen's U., Belfast (Gt. Brit.).
RESEARCH ON PHYSICS OF THE UPPER ATMOSPHERE. PART I.
Final technical rept.,
by D. R. Bates, A. Dalgarno and others.
30 June 61, 1v. incl. illus. tables, refs.
(Contract AF 61(052)131)
(AFCRL-1062-1)
Unclassified report

DESCRIPTORS: (*Upper atmosphere, *Physics, Scientific research.) Great Britain.

Contents:
Formulation of a theoretical basis for the calculation of the polarizabilities of atomic oxygen and atomic nitrogen, and the explicit numerical calculation of these quantities
Calculation of differential scattering cross sections for inelastic electron impact with hydrogen and helium using the first and second Born approximations
Quantitative treatment by a new approximation of some particular ion-atom and atom-atom collisions involving excitation
Development of a scanning interferometer for study of the profiles of the O1 green and red lines in the aurora, twilight and nightglow
Development of IR spectrograph
Calculations of cross-sections for inner shell ionization of atoms by electrons and protons
An estimate of the temperature in the exosphere

AD-271 060 Div. 26, 17
(TISTM/GEC) OTS price $11.00

Republic Aviation Corp., Farmingdale, N. Y.
CAPACITOR DISCHARGE METAL FORMING.
Interim technical progress rept. no. 4, 3 Oct 61-3 Jan 62,
by A. Caggiano, J. Christiana and others.
3 Jan 62, 139p. incl. illus. tables.
(Contract AF 33(600)42920)
(ASD TR 7-844, pt. 4) Unclassified report

DESCRIPTORS: (*Capacitors, *Electric discharges, *Electroforming, Underwater explosions, Sparks, Shock waves, Pressure, Explosive forming, Metals.) (Wave transmission, Liquids, Physical properties, Density, Viscosity, Dielectric properties, Acoustics, Velocity.) (Aluminum tubing, Mechanical properties, Tensile properties, Stresses.)

The energy transfer phenomena in electro-hydraulic-metal forming are described. The variable parameters of energy level, inductance, initiation wire material, diameter, and length, gap distance, standoff distance, and liquid medium were evaluated relative to current, pressure, and deformation work. Optimum values for each of these parameters were established. Techniques of calibrating the deformation work obtained in tubes expanded by the electro-hydraulic-forming process are described. Limited mechanical properties of expanded Al tubes are presented. (Author)

AD-271 106 Div. 26, 1
(TISTA/VGW) OTS price $2.60

Lodge and Shipley Co., Cincinnati, Ohio.
MAGNESIUM ALLOY AIRFRAME.
Monthly progress rept. no. 10, 1-30 Nov 61.
11 Dec 61, 24p. incl. illus.
(Contract DA 33-008-ORD-2084, Proj. TN2-8106)
Unclassified report

DESCRIPTORS: (*Airframes, *Magnesium alloys, Processing, Hydroforming, Design, Production, Manufacturing methods.) (Machining of Conical bodies, Configuration, Templates.)

AD-271 377 Div. 26, 17
(TISTM/GEC) OTS price $1.60

Aeroprojects, Inc., West Chester, Pa.
ULTRASONIC WELDING OF REFRACTORY METALS.
Progress rept. no. 5, 1 Oct-30 Nov 61,
by C. R. Frownfelter. 24 Jan 62, 11p. incl. illus. tables.
(Contract NOw 61-0410-c)
Unclassified report

DESCRIPTORS: (*Refractory materials, *Heat resistant alloys, *Ultrasonics, *Welding, Sheets.) (Molybdenum alloys, Titanium alloys, Niobium, Tungsten, Aluminum, Standing wave ratios, Foils, Titanium, Tantalum.) (Welds, Mechanical properties, Tensile properties, Shear stresses, Deformation, Fracture (Mechanics).)

The reproducibility of weld strength values for 0.005- and 0.010-inch Mo-0.5Ti as well as the quality of these bonds were evaluated. In one

case, the effect of foil interleaf was investigated. Limited shear-strength studies were made with 0.005-inch Nb. The feasibility of using ultrasonics to determine weld integrity is being explored. (Author)

AD-271 402 Div. 26, 30, 17
(TISTM/GEC) OTS price $9.60

McDonnell Aircraft Corp., St. Louis, Mo.
RETROFIT OF A KEARNEY AND TRECKER CSM HORIZONTAL BED MILL WITH BENDIX NUMERICAL CONTROLS.
Final rept.,
by J. H. Rohde. 9 Nov 61, 93p. incl. illus.
(Contract NOa(s) 59-4221-F; Continuation of Contract NOa(s) 59-4188-F)
Unclassified report

DESCRIPTORS: (*Machines, *Machining, Alloys, Aluminum alloys, Magnesium alloys, Steel, Machine tools, Programming, Control, Computers, Automation.) Production, Costs, Design, Military requirements, Specifications.

A Kearney and Trecker CSM Horizontal Bed Mill was retrofitted with Bendix Numerical Controls and the performance evaluated in the machining of 5 pieces each of 5 typical aircraft parts. Time required in planning, part programming and computer operations for the retrofit was comparable to that required for a new N/C machine. Tooling-design and fabrication time was also considered comparable. The efficiency of this machine when compared to an N/C machine was set-up time, 92.9% and machining time 87.5%. Structural design and low spindle speeds of the original machine imposed the limitations which resulted in the lowered efficiency. The average composite time efficiency per piece (set-up + machine time) for the parts produced was 90.8% that of an N/C machine. Inspection time required was considered equal. Accuracy of the parts was 96.3% as good as those produced by a new machine. Surface finishes were comparable. Cost of retrofitting a second machine of this type was quoted at 92.6% of the cost of an N/C machine, comparable in size and capacity. Procurement time through retrofitting is 43% longer than that required for an N/C machine. (Author)

AD-271 427 Div. 26, 17
(TISTM/EJH) OTS price $2.60

Narmco Industries, Inc., San Diego, Calif.
EXO-REACTANT NICKEL BASE STRUCTURAL ADHESIVES.
Quarterly progress rept. no. 1, 1 Jan-31 Mar 61,
by Ralph Armstrong and Roger A. Long. 9 Apr 61, 20p. incl. illus. tables.
(Contract NOw 61-0308-c)
Unclassified report

DESCRIPTORS: (*Stainless steel, *Nickel alloys, Chromium alloys, Cobalt alloys, *Brazing, Materials, Ceramic materials, Adhesives, Chemical reactions, Manganese alloys, Nickel alloys, Bonding, Processing.)

A method was developed for bonding stainless steel by means of in situ exothermic reactions, the products of which supply the metallic brazing material, the flux, and the major part of the heat required. Several exo-reactant compositions were evaluated as to their suitability for stainless steel bonding. An exo-reactant composition, designated SP, producing an 85-15 Ni-Mn braze alloy was selected for further development. The bonding of Rene 41 was investigated briefly. Indications are that fluxing and wet-ability is not a serious problem; however, exo-adhesives must be developed with ceramic and metallic phases with lower melting points than the SP composition developed in this investigation. (Author)

AD-271 520 Div. 26, 17, 25, 29
(TISTM/BRW) OTS price $9.10

Philco Corp., Blue Bell, Pa.
REVERSIBLE ELECTROPLATING LIGHT MODULATOR: THEORY AND DESIGN PRINCIPLES; PRELIMINARY CYCLING EXPERIMENTS; PLATING SPEED MEASUREMENTS WITH SHUTTERS OF INCREASED AREA.
Suppl. to Final rept. on Aerospace Systems Personnel Protection,
by S. Zaromb, J. Mantell, and J. Y. Chang.
Jan 62, 104p. incl. illus. tables, refs.
(Contract AF 33(616)7928, Proj. 6301)
Unclassified report

DESCRIPTORS: (Photoelectric materials, *Goggles for Theory, Design.) (*Electroplating of Metal films, Silver alloys, Sodium alloys on Glass electrodes, Ceramic coatings, Tin compounds, Oxides, Electrical conductance for Control of Light transmission and Reflection.) (Electrolytes, Solutions, Silver compounds, Sodium compounds, Iodides, Electric currents, Electric potential.) (Lenses, Display systems, Transparent panels, Space environmental conditions.) Safety, *Photoelectric shutters.

AD-271 522 Div. 26, 13
(TISTP/JW) OTS price $3.60

Applied Mathematics and Statistics Labs., Stanford U., Calif.
SURVEILLANCE PROGRAMS FOR DETERIORATING LOTS IN STORAGE,
by Frederick S. Hillier. 2 Jan 62, 34p. incl. illus. 3 refs. (Technical rept. no. 56)
(Contract Nonr-22553, Proj. NR 042-002)
Unclassified report

DESCRIPTORS: (Monitors, *Deterioration, Storage, *Supplies, *Control systems.) (Management engineering, Supply depots, Temperature, Corrosion, Humidity, Maintenance.)

Military and civilian organizations require that a sufficient supply of materials be in storage to meet certain emergency needs that may arise. It is essential that a systematic program for the surveillance of stored items be maintained to insure that the supply of usable items is adequate. The determination of time between corrective actions is considered to minimize the total expected cost of the surveillance program. The operating characteristics of a given surveillance program are presented and a critical equation derived for general cost functions. It is developed and simplified for specific cost functions of interest with illustrative examples. Results are discussed and a suggestion made indicating how the principles can be applied in the initial absence of information regarding the distribution of storage life. Conclusions are summarized.

AD-271 536 Div. 26, 17, 4, 1
(TISTM/BRW) OTS price $6.60

Douglas Aircraft Co., Inc., Long Beach, Calif.
CHEMICAL COMPOUNDS FOR METAL SHAPING.

Interim technical progress rept., 30 June-31 Dec 61,
by J. L. Jamieson and F. J. Lockhart. Jan 62, 1v. incl. illus. tables, 11 refs.
(Contract AF 33(600)43027, Proj. 7-648; In cooperation with University of Southern Calif.)
(ASD TR 7-648, vol. 1)
Unclassified report

DESCRIPTORS: (*Alloys, and *Metals for Aircraft, Materials and Structures, Production by *Chemical milling, Gels, Carboxymethylcellulose, Porous materials, Solids, Solutions, Chemicals.) (Processing, Steel, Stainless steel, Nickel alloys, Titanium alloys, Vanadium alloys, Chromium alloys, Aluminum alloys, *Refractory materials, Heat resistant alloys, Molybdenum alloys, Titanium alloys, Tantalum, Niobium.)

Several gel systems were prepared with acid solutions suspended in a gel matrix of organic, water soluble resins. These gel etchants can be cast into semirigid shapes and are stable at temperatures up to 140 to 160 F. In contact with a steel surface, the gel etchants chemically react and remove metal at a controlled rate. The reaction products and reactants migrate countercurrently through the gel media. Further development and testing will determine applicability as non-liquid etchants. (Author)

AD-271 546 Div. 26, 17
(TISTM/BRW) OTS price $1.10

Aerospace Information Div., Washington, D. C.
HOT MACHINING.
23 Jan 62, 4p. incl. illus. (AID rept. 62-10; Trans. vol. 9, no. 11:pp. 552-556, Nov 61)
Unclassified report

DESCRIPTORS: (Resistance, Heating, *Machining, Hardness, Reduction of Steel, Cast iron.) Electrical equipment, Industrial production, USSR, Alloys, Metals.

Two methods are described for improving machinability and metal removal rates in the machining of hardened steel, chilled cast iron, and other metals and alloys which are difficult to machine. The methods include resistance heating by an electric current passing from the cutting tool through the workpiece, or entering directly into the workpiece from a special terminal. The second method was favored since the cutting-tool life was increased by 30 to 50%. Sintered WC containing 2 to 3% Co and ceramic cutting tools were used. The combined action of the electric current and heat generated during cutting heated a thin layer of metal to 950 to 1100 C. This facilitated cutting, reduced friction and the cutting force required as well as eliminating chatter.

AD-271 551 Div. 26, 17
(TISTM/GEC) OTS price $9.10

Hamilton Standard Div., United Aircraft Corp., Windsor Locks, Conn.
ELECTRON BEAM WELDING OF TUNGSTEN AND MOLYBDENUM.
by Harry A. Hokanson and William I. Kern.
Dec 61, 96p. incl. illus. tables, 6 refs.
(Contract AF 33(616)7439, Proj. 7351)
(ASD TR 61-461) Unclassified report

DESCRIPTORS: (*Tungsten, *Molybdenum alloys, Sheets, *Electric welding, Welding, Electron beams.) (Welds, Welded joints, Radiographic analysis, Metallurgical analysis, Mechanical properties, Tensile properties, Surface properties, Deformation, Fracture (Mechanics), Porosity, Grains (Metallurgy), Melting, Crystallization.) (Machining, Electroerosive machining, Processing.) Metals, Alloys.

Techniques for the high-voltage electron beam welding of pure W and arc-cast Mo-0.5% Ti were developed and evaluated. Welds were produced in sheet thicknesses of 0.005, 0.050, and 0.100 in. for each material. Primary emphasis was placed on producing butt welds of maximum strength and ductility. Limited work was performed on lap, seam, edge, and spot welding. The effects of various welding conditions on weld-zone characteristics were evaluated by visual, radiographic, fluorescent penetrant, and metallographic inspection. Welds were inspected for extent of fusion and recrystallization, grain size, cracking, porosity, and other pertinent effects. Butt welds of each thickness exhibiting optimum weld-zone characteristics were evaluated for mechanical properties. Weld ductilities were determined by transverse bend testing at temperatures to 1200 F. Weld tensile properties were determined at room temperature and at temperatures to 2800 F. (Author)

AD-271 561 Div. 26, 8, 25
(TISTE/REB) OTS price $1.60

Knights, James, Co., Sandwich, Ill.
GLASS ENCLOSED MINIATURE CRYSTAL UNITS CR(XM-29/U).
Rept. no. 2, Feb-Oct 61.
Oct 61, 16p. incl. illus.
(Contract DA 36-039-sc-81298)
Unclassified report

DESCRIPTORS: (*Crystal oscillators, Quartz crystals, Glass seals, Vacuum seals, *Seals, *Crystal holders, *Heating elements, Manufacturing methods.) Miniature electronic equipment.

Three methods of sealing glass enclosures, type HC-26, were tried. A gas flame method was found to be best, since control of crystal unit heating is more satisfactory. A sealing machine was developed around the well-known vertical lathe but with an improved gas flow control and vacuum chuck. The operating procedure for this equipment is described. (Author)

AD-271 635 Div. 26, 17
(TISTM/GEC) OTS price $8.10

Wah Chang Corp., Albany, Oreg.
FLOW TURNING OF TUNGSTEN ALLOY SHEETS.
Interim technical progress rept., 22 May-22 Aug 61 on Phase 1,
by S. A. Worcester and James Wong. 22 Aug 61, 79p. incl. illus. tables, 30 refs.
(Contract AF 33(600)43034)
(ASD TR 7-917, vol. 1)
Unclassified report

DESCRIPTORS: (*Manufacturing methods, Processing, Refractory materials, Alloys, *Tungsten alloys, *Molybdenum alloys, Sheets.) (Rocket motor nozzles, Conical nozzles, Rings, Production, Machining.) Casting.

The state-of-the-art of production of large W rings and the flow turning of W shapes is reviewed. The flow turning process is discussed

and a comparison is made between conventional rolling and flow turning as a process for making sheet. Although fairly extensive work on the fabrication of W cones and nozzles was reported, only 2 organizations indicated experience with the manufacture of W cylinders by flow turning. Production of Mo alloys is presented. Commercially available W alloys are briefly discussed and unalloyed W was chosen for this program on the basis of known fabricability and acceptable high temperature properties. Methods for preparation of the 12-in diameter starting blanks are presented. Sintering and ring rolling, and sintering, rolling, forming, and joining were chosen as the most promising techniques for starting blank preparation. (Author)

DESCRIPTORS: (Rocket motors, *Hypersonics, Rocket propellants, Hypervelocity vehicles.) (*Rocket propellants, Detonation, Heat of reaction, Dissociation, Recombination reactions, Hydrogen, Air, Nitrogen, Acetylenes.) (Atmosphere models, Ionosphere models.)

Detonation characteristics of hydrogen-air mixtures in the 1959 ARDC Model Atmosphere environment, including atomic oxygen and nitrogen, are computed to 450,000 ft assuming one-dimensional, inviscid, real-gas conditions. The velocity limits of strong detonations (based on total enthalpy change) are discussed. Atomic oxygen reactant suppresses the exothermic reaction to H20 in favor of recombination, making hydrogen use above 400,000 ft unattractive. Equilibrium temperature and pressure ratios across detonations decrease with altitude, especially above 350,000 ft; they are extremely sensitive, and inversely proportional, to reactant temperature, and pressure exhibits a secondary effect. For comparable detonation conditions, acetylene appears almost as good an energy source as hydrogen. (Author)

27. PROPULSION SYSTEMS

AD-270 926 Div. 27
(TISTP/TL) OTS price $ .75

National Aeronautics and Space Administration, Washington, D. C.
EVALUATION OF A HOLLOW, CYLINDRICAL, CONTACT-ION SOURCE,
by J. Thomas Kotnik. Feb 62, 28p. incl. illus., 7 refs.
(NASA Technical note D-1187)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical note D-1187.

DESCRIPTORS: (*Cylindrical bodies, Coatings, *Metal film, *Ions, Electrostatics, Analysis, *Electric propulsion, Rocket motors.) (Cesium, Vapors, Ionization) (Platinum, Tantlum, Wire, Heating, Density, Space charges.) (Differential equations, Integral equations.) Ion sources.

An aluminum oxide tube, coated on the inside by a thin film of platinum, was maintained between 1590 and 1725 K for contact ionization of cesium. Cesium vapor was injected at one end of the tube, and the effect on the maximum ion current of a potential gradient applied across the ends of the film was measured. The current densities obtained were less than 1 ampere per square meter, which would make this device inapplicable for space propulsion. Heat loss from the cylinder was very great, more than 10 to the sixth power electron volts per ion, which produced efficiencies of less than 1 percent. (Author)

AD-270 927 Div. 27, 4, 22
(TISTP/WH) OTS price $5.60

Republic Aviation Corp., Farmingdale, N. Y.
CHEMICAL DETONATIONS IN THE UPPER ATMOSPHERE,
by K. M. Foreman and P. Wilson. 20 Oct 61, 47p. incl. illus. 21 refs. (Rept. no. PPL-TR-61-24(477))
(Contract AF 49(638)552)
(AFOSR-1763) Unclassified report

Presented as a technical paper at the XII'th International Astronautical Congress, Washington, D. C., October 4, 1961.

AD-271 034 Div. 27
(TISTB/AW) OTS price $1.60

Lockheed Aircraft Corp., Sunnyvale, Calif.
CONSTRUCTION MATERIALS FOR CONTAINERS OF LIQUID PROPELLANTS: HYDROGEN, FLUORINE, HYDRAZINE AND NITROGEN TETROXIDE. AN ANNOTATED BIBLIOGRAPHY, comp. by George R. Evans. Apr 60, 18p. 142 refs.
(Special bibliography no. SB-60-20)
Unclassified report

DESCRIPTORS: (*Bibliography, *Materials, Metals, *Containers, *Liquid rocket propellants, Liquefied gases.) (Hydrogen, Fluorine, Hydrazines, Nitrogen compounds, Tetroxides.)

AD-271 065 Div. 27, 17
(TISTA/SEB) OTS price $9.10

Budd Co., Philadelphia, Pa.
DEVELOPMENT OF HIGH PERFORMANCE ROCKET MOTOR CASE.
Quarterly engineering progress rept. no. 18, 1 Oct-31 Dec 61,
by R. C. Dethloff. 31 Dec 61, 1v. incl. illus. tables
(Contract DA 36-034--ORD-3296; Proj. OMS-5010-1180800-51-03)
Unclassified report

DESCRIPTORS: (Solid rocket propellants, Rocket motors, *Rocket cases, Materials, Alloys, Design, Manufacturing methods, Welding, Welded joints.) (Stainless steel, Steels with Nickel alloys, Titanium alloys, Vanadium alloys, Aluminum alloys, Chromium alloys.) (Heat treatment, Aging.) (Mechanical properties, Tensile properties, Fracture (Mechanics), Tests.) (Cylindrical bodies, Stresses, Mathematical analysis.)

Design drawings were completed for the 20 in. diameter test chamber in the development of a solid rocket motor case. Two alloys, Ti-13V-11Cr-3Al alloy and 20% Ni steel having 1.7 Ti and 0.5 Al, were selected as the fabricating materials. Manufacturing of the cases was begun. Welding tests were continued.

AD-271 174 Div. 27, 26, 12, 17
(TISTA/VGW) OTS price $.75

Defense Metals Information Center, Columbus, Ohio.
THE USE OF NICKEL-BASE ALLOYS IN THE ROTATING PARTS OF GAS TURBINES FOR AEROSPACE APPLICATIONS,
by C. H. Lund. 11 Jan 62, 20p. incl. illus. table, 9 refs. (DMIC memo. no. 145)
Unclassified report

DESCRIPTORS: (*Heat resistant alloys, *Nickel alloys for Production of *Gas turbines, Rotating structures, Turbine blades, Turbine wheels, Gas turbine rotors in Auxiliary power plants, Centrifugal pumps, Fuel pumps of Rocket motors, Ground support equipment, Gas generating systems, Reliability, Effectiveness.) Booster rockets.

Unclassified information is presented on the use of nickel-base alloys in rotating machinery for aircraft, missiles, and related ground-support equipment. Less emphasis is placed on aircraft propulsion units, because a large bibliography already exists for these applications; only recent developments are included here. Rather, primary attention is placed on auxiliary power units and starters for aircraft, ground-support equipment, and turbopump units for missiles. This memorandum is concerned primarily with materials. Because the operational parameters are vastly different for the various turbines, the choice of alloy for a given application depends upon the wide variety of mechanical and physical requirements demanded by the service conditions. In addition, a summary of present and proposed manufacturing and fabrication methods is included. (Author)

AD-271 416 Div. 27, 26, 17
(TISTA/VGW) OTS price $5.60

General Electric Co., West Lynn, Mass.
TIME TEMPERATURE INTEGRATION DEVICE.
Final rept.
15 Dec 61, 27p. illus.
(Contract NOw 60-0545-c)
Unclassified report

DESCRIPTORS: (*Thermocouples, Design, Recording devices for Measurement of *Jet engines, Turbojet engines, Aging.) (Electrical conductance on Thermal diffusion, Metal films in Exhaust gases.) (Bonding, Thin films of Chromium, Iron, Palladium, Platinum, Gold, Silver, Tests, Preparation, Manufacturing methods.)

The development is reported of a small, lightweight device which when placed in the exhaust stream of a jet aircraft engine would integrate its time-temperature history for possible correlation with engine aging. A limited number of prototypes were produced. Performance of the device was based upon the change in electrical resistance of a Pd-Pt composite as a result of the mutual solid state diffusion of those metals. The integrating elements in the prototypes consisted of a 50-layer roll-bonded composite containing alternate Pd and Pt foils. Cyclic time-temperature tests have shown that the device does integrate its time-temperature history, and isothermal tests have shown the prototype activation energy to be about 31,000 calories per mole. This activation energy was lower than expected, but was higher for the prototypes than for the unclad test specimens (22,000). The mechanism by which the manufacturing process increased the activation energy is not clear. (Author)

AD-271 436 Div. 27, 17
(TISTM/GEC) OTS price $1.10

Rolla Metallurgy Research Center, Bureau of Mines, Mo.
VAPOR DEPOSITION OF TUNGSTEN AND THE EFFECTS OF PROCESS VARIABLES.
Monthly progress rept. no. 3,
by F. W. Hoertel. Jan 62, 4p. incl. illus.
Unclassified report

DESCRIPTORS: (*Rocket motor nozzles, Coatings, *Vapor plating, *Tungsten, Tungsten compounds, Beryllium compounds, Oxides, Crystallization.)

One graded W-BeO nozzle insert was coated with W. The BeO reacted with the gases in the reaction zone to create unfavorable coating conditions. Several indentations in the W coating appear to have been caused by the escape of reaction products. The W coating projects from the contour of the insert in a form resembling layers peeled from the surface. Clear crystals were formed on cooler surfaces within the reaction zone. (Author)

AD-271 510 Div. 27, 8, 25
(TISTA/VGW) OTS price $1.25

National Aeronautics and Space Administration, Washington, D. C.
ACCELERATOR GRID TESTS ON AN ELECTRON-BOMBARDMENT ION ROCKET,
by William R. Kerslake. Feb 62, 42p. incl. illus. tables, 14 refs. (NASA Technical note no. D-1168)
Unclassified report

Also available from NASA, Wash. 25, D. C., as NASA Technical note no. D-1168.

DESCRIPTORS: (Molybdenum, Wire screens, *Ion accelerators, Electron bombardment, Mercury, Ion beams for *Ion rockets, Electric propulsion, Tests.)

A systematic investigation of screen-accelerator grids was made with an ion rocket having a 10-centimeter-diameter electron-bombardment ion source. Mercury ion beams of 0.03 to 0.44 ampere were operated at net accelerating voltages of 900 to 6100 volts. A multihole screen-accelerator grid set passed the greatest percent of an ideal plane diode current with a ratio of between-grid spacing to individual hole diameter of approximately 1. Breakdown between the grids occurred at field strengths of 2000 to 3000 volts per millimeter for grid spacings of 1 to 3 millimeters. The accelerator impingement was about 1 percent and caused little erosion of the molybdenum grids, which indicated a grid life of the order of 1000 hours or better. The experimental work was conducted in a bell jar connected to a 5-foot-diameter by 16-foot-long vacuum tank at Lewis Research Center. (Author)

28. PSYCHOLOGY AND HUMAN ENGINEERING

AD-270 908 Div. 28
(TISTB/MS) OTS price $1.10

School of Aerospace Medicine, Brooks Air Force Base, Tex.
FACTOR STRUCTURE OF SEMANTIC DIFFERENTIAL RE-

SPONSES TO VISUAL FORMS AND PREDICTION OF FACTOR SCORES FROM STRUCTURAL CHARACTERISTICS OF THE STIMULI,
by Lois L. Elliott and Percy H. Tannenbaum.
Nov 61, 8p. incl. illus. tables, 11 refs.
(Rept. no. 62-8)
(In cooperation with Wisconsin U., Madison)
Unclassified report

DESCRIPTORS: (*Visual perception, Stimulation, *Psychometrics.) (*Language, Theory.) Factor analysis.

Two samples of nonsense shapes, containing 36 and 32 stimuli respectively, were judged on 20 semantic differential scales. Separate factor analyses and rotations produced highly similar factor structures for the two samples and the total group. Four factors were obtained, representing dimensions of complexity-activity, esthetic-evaluation, size-potency, and hardness-angularity. Multiple regression solutions, predicting factor scores from physical measurements, indicated better prediction for the sample in which symmetry and curvature were varied. (Author)

AD-270 938 Div. 28, 15
(TISTB/MS) OTS price $2.60

Georgia U., Athens.
THE CONSTANT-RATIO RULE AND RECOGNITION TASKS. Final rept.,
by Milton H. Hodge. Jan 62, 25p. incl. tables, 31 refs.
(Contract AF 19(604)7299)
(ESD TDR 62-2)
Unclassified report

DESCRIPTORS: (*Psychology, *Visual perception, Behavior, Theory, *Psychometrics, Conditioned reflex, Learning.) (Matrix algebra, Mathematical prediction, Probability.) (*Display systems, Target recognition, Intelligibility.)

A review is presented of experimental studies designed to evaluate the constant-ratio rule as a predictor of confusion patterns in recognition tasks. The rule makes satisfactory predictions of the confusability associated with multidimensional stimulus displays and with relatively large single dimensional displays. As a model of choice behavior, the usefulness of the rule was judged to be limited because of its sensitivity to response bias. (Author)

AD-271 017 Div. 28
(TISTB/MS) OTS price $1.10

Human Resources Research Office, George Washington U., Washington, D. C.
BIBLIOGRAPHY OF REPORTS, 1 JULY TO 31 DECEMBER 1961.
Jan 62, 5p.
Unclassified report

DESCRIPTORS: (*Bibliography, Human engineering.) (Military research, Reports.) (*Military operations, Training, Military training.)

AD-271 066 Div. 28
(TISTB/MS) OTS price $1.60

Behavioral Sciences Lab., Aerospace Medical Div., Wright-Patterson Air Force Base, Ohio.
HUMAN ENGINEERING PRINCIPLES OF DESIGN FOR IN-SPACE MAINTENANCE.
Rept. on Human Performance in Advanced Systems, by Leroy D. Pigg. Nov 61, 10p. incl. 17 refs. (Proj. 7184)
(ASD TR 61-629) Unclassified report

This paper was presented at the Joint National Meeting of the Institute of Aerospace Sciences and the American Rocket Society, June 1961, Los Angeles, California.

DESCRIPTORS: (*Human engineering, Space flight.) (*Spaceships, *Satellite vehicles, *Maintenance, Maintenance personnel, Sensory perception, Weightlessness, Visual acuity, Motor reactions, Positioning reactions.) (*Remote control systems, Test equipment, Design.)

Results of research on problems related to human performance of maintenance actions in space systems are reviewed. The interactions of sensory, psychomotor, and motor functions are discussed, along with problems of remote-handling applications in the space environment. (Author)

AD-271 096 Div. 28, 15
(TISTB/MS) OTS price $1.60

Duntley, S. Q., La Jolla, Calif.
A LINEAR ANALYTIC MODEL OF THE VISUAL SYSTEM, by James L. Harris. June 61, 11p. 1 ref. (Rept. no. 6-4)
(Contract NObs-72039, Proj. NS 714-100)
Unclassified report

DESCRIPTORS: (*Optical systems, Vision, Visibility, Detection, *Visual perception, Target recognition.) (Mathematical analysis, Equations, Mathematical prediction.)

Equations were derived which represent a first step toward the determination of the extent to which visual performance is effected by spatial summation, temporal summation, lens aberrations, and transmittance of the optical system. Numerical evaluation of these equations and comparison with experimental visual data will give a more meaningful determination of how closely the visual performance approaches quantum limitations than can be achieved by comparison to an ideal detector. While the distinction between approaches is academic, if one is interested only in rating visual performance as compared to other sensors, the distinction is vitally important if the goal is the generation of analytic models of the visual system. (Author)

AD-271 097 Div. 28
(TISTB/MS) OTS price $1.60

Duntley, S. Q., La Jolla, Calif.
AN EXPERIMENTAL EVALUATION OF THE FLUCTUATION LIMEN AS AN INDICATOR OF VISUAL PERFORMANCE. Interim rept. no. 1,
by John H. Taylor. Mar 61, 17p. illus. 4 refs. (Rept. no. 6-3)
(Contract NObs-72039, Proj. NS 714-100)
Unclassified report

DESCRIPTORS: (*Vision, *Visual perception, *Visual thresholds, Measurement, Data, Visibility, Collecting methods, Instrumentation.)

The status of an investigation into a novel method for the collection of visual performance data is described. This technique, called the fluctuation limen method, has obvious advantages in certain psychophysical investigations owing to the rapidity with which thresholds can be estimated. Instrumentation for efficient data

collection has been devised, and some preliminary studies were made to evaluate the method in terms of absolute values obtained by its use, as well as to determine the effects of training. Other studies are needed to assess the method in terms of the criteria which have been enumerated. While the data are fragmentary, all indications are that the technique deserves further study as a possible means for the rapid collection of visual performance data. (Author)

AD-271 148 Div. 28, 30
(TISTB/AW) OTS price $1.60

Educational Testing Service, Princeton, N. J.
A MACHINE SEARCH FOR MODERATOR VARIABLES IN MASSIVE DATA,
by John W. French. May 61, 18p. incl. illus. tables, 6 refs.
(Contract Nonr-221400, Proj. NR 151-174)
Unclassified report

DESCRIPTORS: (*Aptitude tests, *Personality tests, Statistical analysis, *Mathematical prediction, Computers.)

Searching for moderator variables in massive data was carried out with the IBM 650. Indices to represent validities for all possible predictors based on subjects standing low, middle, and high on all possible moderator variables were computed. Predictors and criterion scores were paired after both had been trichotomized; this gave 3 x 3 contingency tables from which the indices were derived. The method permitted the speed necessary for the search, but allowed distortion due to skewness in the distributions of the variables and of correlation between the moderator variable and either the predictor or the criterion. Three groups of subjects totaling 1297 students were used with 42 predictors. The indices resulted in a small number of situations where moderator variables were operating effectively. The relationship between the indices and product-moment correlations was unsatisfactory due to distortion. Either a larger machine is required or a more time-taking, expensive computational procedure is necessary. One clear moderator variable was revealed: visual spatial ability interferes with the correlation between interest in English and grades in English.

AD-271 149 Div. 28
(TISTB/AW) OTS price $8.10

Educational Testing Service, Princeton, N. J.
THE MEASUREMENT OF THE RELATIVE APPEAL OF MILITARY SERVICE PROGRAMS,
by Robert E. Dear and Ledyard R. Tucker.
June 61, 1v. incl. illus. tables, 17 refs.
(Contract Nonr-69400, Proj. NR 151-113)
Unclassified report

DESCRIPTORS: (*Industrial psychology, *Military psychology, *Recruiting, Military personnel, Psychometrics, Mathematical analysis, Combinatorial analysis, Effectiveness.)

The usefulness of different methods for measuring the relative strength of appeal of various military service programs was evaluated by applying psychometric scaling models. The mathematical models are instances of the extension of the response-surface design theory to judgmental or subjective responses. The scales were administered to senior boys in high school. It appeared that the rating scale procedure would be preferred for such studies if only one scale were to be used. Detailed recommendations cannot be made concerning how to structure military service programs owing to the dominance of the component of length of tour of active service. A refined analysis of the most appealing configurations of components to military service candidates seems to be an important next step in recruitment research.

AD-271 386 Div. 28
(TISTB/AW) OTS price $1.60

Educational Testing Service, Princeton, N. J.
AN ANALYSIS OF THE EFFECTS OF REPETITIVE TESTING ON FIGURE MATRIX TEST SCORES,
by Carl E. Helm. June 61, 10p. incl. illus. tables.
(Contract Nonr-233800, Proj. NR 151-182)
Unclassified report

DESCRIPTORS: (*Aptitude tests, *Achievement tests, Statistical analysis, Reliability, Analysis of variance.)

An analysis of existing data was made as a preliminary investigation of (1) the effect of practice performance on the Figure Matrix Test, (2) performance on the initial part of a figure matrix test compared with performance on the last part of the test, and (3) a relation between change in performance from the first part of a figure matrix test to the last part and other measures related to achievement. A correlational analysis and an analysis of variance were made. On the average, 15.5 items were correctly answered out of the first 30 items, while 16.7 items were correctly answered out of the second 30 items. Results suggest that the first-half score might be the better measure, in that the correlations between the first-half score and class grades tended to be somewhat higher than the correlations between the second-half score and grades. The total score correlated somewhat higher than either part score, reflecting greater reliability. Relation between change in performance on the first and last part gives negative results by both the correlation and the analysis of variance. Negligible correlations were noted between the difference score on the Figure Matrix Test and grades. (Author)

AD-271 387 Div. 28
(TISTB/AW) OTS price $6.60

Educational Testing Service, Princeton, N. J.
FACTORS IN IN-BASKET PERFORMANCE,
by Norman Frederiksen. May 61, 60p. incl. tables, 5 refs.
(Contract Nonr-233800, Proj. NR 151-182)
Unclassified report

DESCRIPTORS: (*Industrial psychology, Achievement tests, Aptitude tests, *Personality tests, *Factor analysis, Job analysis, Test methods.) (Behavior, Attitudes, Leadership.)

The nature of administrative behavior and some of the major dimensions of administrative performance are studied. The procedures involved are (1) the development of in-basket materials, (2) the development of methods for scoring records of performance in the simulated job, and (3) the analysis of the intercorrelations of these scores, by factoring, as a means for revealing whatever major dimensions of behavior may exist in the data. Subjects in the present study included members from a variety of groups; comparisons of these groups with respect to in-basket scores are of interest from the stand-

point of construct validity. A further stage of the study will be concerned with the relationships of dimensions of administrative performance to various other measures of abilities and personality. (Author)

AD-271 388 Div. 28
(TISTB/AW) OTS price $4.60

Educational Testing Service, Princeton, N. J.
CONSISTENCY OF PERFORMANCE IN SIMULATED SITUATIONS,
by Norman Frederiksen. Dec 61, 41p. incl. illus. tables, 4 refs. (Rept. no. RB-61-22)
(Contract Nonr-233800, Proj. NR 151-182)
Unclassified report

DESCRIPTORS: (*Industrial psychology, *Personality, *Personality tests, Behavior, Achievement tests, Reliability.)

A study of administrative performance in which 232 elementary school principals took four in-basket tests was made. In three of the in-basket situations the subjects played the role of principal. In the fourth in-basket they acted in an executive capacity. For each of the four in-baskets, scores on 34 categories of behavior were selected for use. There were no marked differences in odd-even reliabilities of scores obtained from the school and business in-baskets. For all in-baskets, the odd-even reliabilities are markedly higher than the alternate form reliabilities. There is more consistency in performance between two school situations than between a school and a business situation. The influence of the background situation is small compared with the difference between odd-even and alternate form reliability. (Author)

AD-271 477 Div. 28
(TISTB/MS) OTS price $12.00

Northrop Corp., Hawthorne, Calif.
GUIDE TO INTEGRATED SYSTEM DESIGN FOR MAINTAINABILITY.
Rept. for Apr 60-June 61 on Human Performance in Advanced Systems,
by Lynn V. Rigby, Joel I. Cooper, and William A. Spickard. Oct 61, 157p. incl. illus. tables, 51 refs.
(Contract AF 33(616)7059, Proj. 7184)
(ASD TR 61-424) Unclassified report

DESCRIPTORS: (*Human engineering, *Maintenance, *Aircraft equipment, Electrical equipment, Design, Indexes.) (*Anthropometry, Test equipment.) (Automatic, *Test equipment, Monitors, Test sets.) Handbooks.

This report presents human engineering recommendations and suggestions concerning the design of Air Force weapon systems for ease of maintenance. The report is divided into three main sections: Introduction, which discusses the format of the report: System Decisions for Maintainability, which discusses system design decisions and interactions; and Detail Design for Maintainability, which presents detailed design recommendations. A Decision Structure Chart provides the system designer with a notation of the critical elements of maintainability and a Topic Index Matrix presents the detail designer with an estimate of the general importance of the interactions of specific design elements. (Author)

AD-271 569 Div. 28
(TISTB/AW) OTS price $2.60

Research Center for Group Dynamics, U. of Michigan, Ann Arbor.
STUDIES ON DRIVE AND INCENTIVE IN PERCEPTION VI: SOME EFFECTS OF DRIVE PRODUCED BY ELECTRIC STIMULATION ON GENERALIZED RESPONSES TO LOUDNESS,
by David E. Carter and Robert B. Zajonc.
Jan 62, 29p. incl. illus. tables, 20 refs.
(Technical rept. no. 16)
(Contract AF 49(638)367)
Unclassified report

DESCRIPTORS: (*Psychology, Perception, *Auditory perception, Conditioned reflex, Reaction (Psychology), Training, Learning, Stimulation, Intensity, Laboratory animals, Pigeons.)

Two groups of pigeons, one given high shock and the other low shock, were trained to peck at a key for food reinforcement. Responses were reinforced in the presence of a tone and extinguished in its absence. Following training, Ss were given the opposite shock intensity and tested for generalization under conditions of extinction to a series of seven auditory stimuli varying in intensity. The predicted drive-stimulus interaction effect seems to occur only briefly after a drive shift. An analysis of the gradients in terms of successive trial blocks showed that the generalization curves, regardless of the direction of the shift in shock level, tended to shift past S(D) away from S(delta). This tendency increased as a function of the extinction process. Several alternative explanations for these effects are discussed but the data do not allow the establishment of the validity of one explanation over another. (Author)

AD-271 605 Div. 28
(TISTB/AW) OTS price $7.60

Bolt, Beranek, and Newman, Inc., Cambridge, Mass.
MASKING OF PURE TONES AND SPEECH,
by N. L. Carter and K. D. Kryter. Oct 61, 73p. incl. illus. tables, 19 refs.
(Contract AF 19(604)4061)
(ESD TDR 62-1) Unclassified report

DESCRIPTORS: (*Speech transmission, Radio communication systems, Noise (Radio).) (*Auditory perception, Auditory acuity, Audiometry, Tonal thresholds, Pitch discrimination.)

The masking effects of intense pure tones and bands of noise upon other pure tones and speech were investigated. Of perhaps special importance are the masking effects of very intense low frequency sounds, in that low frequency sounds are present near missile launch sites. On the basis of the test results, spread of masking functions were obtained that can be incorporated into procedures for the calculation of a new Articulation Index that will be valid for a much wider variety of noise conditions than heretofore possible. (Author)

29. QUARTERMASTER EQUIPMENT AND SUPPLIES

AD-271 381 Div. 29
(TISTB/AW) OTS price $7.60

Naval Supply Research and Development Facility, Bayonne, N. J.
EVALUATION OF DEHYDRATED DICED AND SLICED

POTATOES FOR SHIPBOARD USE,
by B. S. MacNulty, I. Seidenberg and H. R. Ignall. 6 July 61, 58p. incl. illus. tables.
Unclassified report

DESCRIPTORS: (*Dehydrated substances, *Military rations, *Potatoes, Costs, Storage.)

Navy stock dehydrated diced potatoes were compared with fresh white potatoes. The substitution ratio of dehydrate to fresh is 1 pound of dehydrated diced potatoes to 3.8 pounds of peeled, eyed fresh potatoes or 5.1 pounds of unpeeled fresh potatoes. Substitution of dehydrate for fresh would represent an approximate 27% saving in gross shipping weight, an 18.3% saving in storage space, and an 0.766 man-hour saving in machine-peeling and hand-eying of each 100 pounds of fresh potatoes used. The dehydrate was found to be organoleptically inferior to fresh potatoes. A relatively new commercial product, dehydrated sliced potatoes, was evaluated. This product is organoleptically superior to commercially available and Navy stock dehydrated diced potatoes and is comparable to fresh white potatoes. The weight ratio of dehydrated sliced potatoes to fresh potatoes is similar to the ratio for diced. The sliced offers approximately the same weight, space, and man-hour savings as the diced. The sliced potatoes are apt to cost more initially than the diced, but may eventually become equivalent in price. (Author)

AD-271 475 Div. 29
(TISTB/LH) OTS price $8.60

Whirlpool Corp., St. Joseph, Mich.
COMPACT FEEDING CONSOLE DESIGN, FABRICATION, AND EVALUATION.
Rept. for 27 June 60-31 May 61 on Equipment for Life Support in Aerospace,
by H. E. Brehm. Oct 61, 90p. incl. illus. tables.
(Contract AF 33(616)7503, Proj. 6373)
(ASD TR 61-569) Unclassified report

DESCRIPTORS: (*Containers, Food, Storage, Preparation, Space flight, *Feeding.) Design, Production, Tests.

A Compact Feeding Console was designed to meet the sustenance requirements of three men for an extreme altitude mission of 14 days duration. A comprehensive study of the human and environmental conditions revealed that the astronauts would need equipment, devices, and facilities for storage, preparation--cooling or heating--of canned, frozen, dehydrated, and ready foods; a water storage, cooling and heating system; a wet and dry waste treatment and storage system; and feeding tools. The equipment and systems were tested to evaluate expected performance under operating conditions from normal gravity and 1 atmosphere pressure to weightlessness (also called zero gravity in this report) and 1/2 atmosphere pressure, and acceleration forces from 2 to 8 g's, to insure both independent operation of the component sections and integrated operation of the total Console in compliance with predetermined optimal performance standards. (Author)

30. RESEARCH AND RESEARCH EQUIPMENT

AD-270 942 Div. 30, 32
(TISTB/MS) OTS price $10.50

Stanford Research Inst., Menlo Park. Calif.
REQUIREMENTS, CRITERIA, AND MEASURES OF PERFORMANCE OF INFORMATION STORAGE AND RETRIEVAL SYSTEMS.
Final rept.,
by C. P. Bourne, G. D. Peterson and others.
Dec 61, 132p. incl. illus. tables, 12 refs.
Unclassified report

DESCRIPTORS: (*Data processing systems, *Data storage systems, Documentation.) (*Computers, Costs, Analysis.)

A preliminary study was made of the requirements, criteria, and measurems of performance of information storage and retrieval systems. A total of 92 applied electronics researchers and 11 metallurgists were interviewed to measure and rank several different requirements for information. It was found that some requirements could definitely be measured, and that there was general disagreement among the users about the relative importance of various information requirements. The methodology and the interview guide could be extended, with minor modifications, to other technical subject fields. In addition, three separate and complementary tools were developed for the analysis and evaluation of information retrieval systems: (1) a coarse screening procedure; (2) two different performance evaluation procedures; and (3) two cost analysis procedures that used computer programs to simulate the operation of candidate systems to determine their operating costs over wide ranges in operating conditions. A general functional model of a storage and retrieval system was developed for use by these cost analysis programs. (Author)

AD-270 958 Div. 30
(TISTE/CRJ) OTS price $4.60

Parametrics, Inc., Saxonville, Mass.
DESIGN, DEVELOPMENT AND MANUFACTURE OF AN ELECTROLUMINESCENT PRESSURE TRANSDUCER.
Final rept., 30 Oct 61, 20p. illus.
(Contract NAS5-796)
Unclassified report

DESCRIPTORS: (*Pressure gages, *Transducers, Photoelectric cells, Electrodes, Photoconductivity, Luminescence, Phosphors, Dielectric properties, Crystals, Design, Mathematical analysis.)

Research concerned the design, development, and manufacture of a pressure gauge utilizing a unique pickoff which couples the phenomena of electroluminescence and photoconductivity to obtain a completely solid-state device having an impedance output capable of detecting very small mechanical displacements. The advantages of this device as applied to pressure measurement are: small size and weight of the pressure unit, very high resistance to shock and vibration and infinite resolution over a wide dynamic range. A prototype pressure gauge capable of measuring pressures from 0 to 800 mm Hg and having an electrical output within 1 to 5-v when operated from a conventional 28-v dc power source is described. (Author)

Division 30 - RESEARCH AND RESEARCH EQUIPMENT

AD-271 011 Div. 30, 31
(TISTB/CCH) OTS price $5.60

Navy Experimental Diving Unit, Naval Weapons Plant, Washington, D. C.
THE DEVELOPMENT OF A TEST TO DETERMINE THE ADEQUACY OF DECOMPRESSION FOLLOWING A DIVE, PHASE II,
by R. J. Kiessling and W. B. Wood. 30 June 61, 47p. incl. illus. tables, 41 refs. (Research rept. no. 3-61)
(Proj. NS 186-201/2(4))
Unclassified report

DESCRIPTORS: (*Decompression, *Diving, Design, Test method, Measurement.) (Nitrogen, Oxygen.)

Studies were conducted to develop the altitude technique into a test of decompression adequacy which can be used as a research tool for the evaluation of existing and new decompression procedures in the standard range of nitrogen-oxygen diving. An experimental design was formulated which investigated the technique in relation to acceptable test standards, i.e. reliability, validity, objectivity and others. The altitude technique proved to predict decompression adequacy for the standard range of nitrogen-oxygen diving. (Author)

AD-271 063 Div. 30, 15
(TISTP/LH) OTS price $2.60

Electronics Research Lab., U. of Calif., Berkeley.
A MODIFICATION OF HAMMING CODES FOR USE IN ERROR-DETECTION,
by R. N. Miller. 21 Nov 61, 25p. incl. illus. 4 refs. (Series no. 60, Issue no. 419)
(Contract Nonr-22253)
Unclassified report

DESCRIPTORS: (*Errors, *Detection, *Coding.) (Digital systems, Data transmission systems, Information theory.)

AD-271 090 Div. 30, 25
(TISTP/FR) OTS price $1.10

Duntley, S. Q., La Jolla, Calif.
A VARIABLF-RANGE SIMULATOR,
by Chester J. Silvernail. 21 June 58, 6p. illus. 3 refs. (Rept. no. 1-3)
(Contract NObs-72034, Proj. NS 714-100)
Unclassified report

DESCRIPTORS: (*Range, Simulation, *Optical equipment.) (Binoculars, Telescopes, Test equipment.) *Collimators.

A variable-range viewer for use with binocular and terrestrial telescopes was devised to enable small test charts to be viewed in the laboratory under well-controlled, realistically simulated outdoor conditions. Object distances from 2 to 20 miles are covered by means of a variable magnification optical system. Contrast attenuation by the atmosphere is introduced automaticalloy as the simulated range is changed. Provision was made for presetting any desired meteorological range from 2 to 100 miles. (Author)

AD-271 091 Div. 30
(TISTP/FR) OTS price $2.60

Duntley, S. Q., La Jolla, Calif.
DESIGN AND CALIBRATION OF A PORTABLE STAR PHOTOMETER,
by John H. Taylor. 21 June 58, 14p. illus. 2 refs. (Rept. no. 1-2)
(Contract NObs-72039, Proj. NS 714-100)
Unclassified report

DESCRIPTORS: (*Stars, Brightness, Measurement, *Photometers, Mobile.)

AD-271 092 Div. 30
(TISTP/FR) OTS price $2.60

Duntley, S. Q., La Jolla, Calif.
DESIGN OF AN UNDERWATER RADIANCE PHOTOMETER,
by John E. Tyler. Mar 59, 14p. illus. (Rept. no. 3-2)
(Contract NObs-72039, Proj. NS 714-100)
Unclassified report

DESCRIPTORS: (*Underwater, *Light, Measurement, *Photometers.)

The design features of a radiance photometer capable of measuring the directional distribution of natural light underwater are described. (Author)

AD-271 094 Div. 30, 8
(TISTE/TCG) OTS price $1.60

Duntley, S. Q., La Jolla, Calif.
A NEW LOGARITHMIC PHOTOMETER,
by Richard L. Ensinger. Dec 60, 12p. illus. 1 ref. (Rept. no. 6-1)
(Contract NObs-72039, Proj. NS 714-100)
Unclassified report

DESCRIPTORS: (*Photometers, Photomultipliers, Phototubes, Potentiometers, Photographic recording systems, Recording devices, Electronic circuits, Design.)

A commonly used logarithmic photometer chassis employs 4 cut-in diodes to convert the quasi-logarithmic function to a true logarithmic function. With 4 cut-in diodes this conversion can only be completely accomplished at 5 points in the complete dynamic range. A technique was developed allowing conversion of quasi-logarithmic data to true logarithmic form to 21 points over the dynamic range. The circuitry described is applicable to multiple phototubes and photographic photometry. (Author)

AD-271 095 Div. 30, 8
(TISTE/TCG) OTS price $1.60

Duntley, S.Q., La Jolla, Calif.
A NEW LOGARITHMIC PHOTOMETER - TEST RESULTS,
by Richard L. Ensminger. Mar 61, 5p. illus. 1 ref. (Rept. no. 6-2)
(Contract NObs-72039, Proj. NS 714-100)
Unclassified report

DESCRIPTORS: (*Photometers, Photomultipliers, Phototubes, Potentiometers, Recording devices, Tests, Calibration.)

As a preliminary step in setting in the correction curve. a recording was made over the entire

flux range of the photometer. This curve shows that the photometer has a basic response in excess of six-log cycles. The photometer responds to any portion of this range. By drawing in a straight line over the desired range, the correction voltages are obtained from the difference between the straight line and the actual curve. (Author)

AD-271 108 Div. 30, 25, 17
(TISTM/BRW) OTS price $1.00

Midwest Research Inst., Kansas City, Mo.
ULTRASONIC METHODS FOR NONDESTRUCTIVE MEASUREMENT OF RESIDUAL STRESS.
Rept. for 1 Apr 60-31 Jan 61 on The Chemistry and Physics of Materials,
by Fred Rollins. May 61, 27p. incl. illus. 18 refs.
(Contract AF 33(616)7058, Proj. 7360)
(WADD TR 61-42, pt. 1) Unclassified report

DESCRIPTORS: (*Ultrasonics, *Non-destructive testing, *Metals, *Stresses, Thermal stresses, Plastic flow, Deformation, Lattices, Compression shock, Velocity, Attenuation, Measurement, Elasticity, Aluminum, Steel.) Test equipment, Strain gages, Transducers, Pulse generators, Oscilloscopes.

Shear wave birefringence in metal specimens has been studied as a possible method of nondestructively measuring residual stresses. It was established that the stress-induced birefringence in Al and steel varies linearly with the magnitude of an applied stress and does not change appreciably as these metals are deformed plastically. Other sources of birefringence were studied also. Preferred orientation is a major source especially in rolled metal stock. A pulse echo technique for observing shear wave birefringence is described and the current limitations are discussed. (Author)

AD-271 120 Div. 30, 1, 2
(TISTP/FR) OTS price $12.00

New York U. Coll. of Engineering, N. Y.
RESEARCH BALLOONING,
by Germaine B. Beiser, Robert C. Haymes, and Serge A. Korff. 1 Dec 59, 113p. illus. 20 refs.
(Contract Nonr-28521)
Unclassified report

DESCRIPTORS: (Balloons, Flight paths.) (Meteorological balloons, Instrumentation.) (Cosmic rays, Measurement, Instrumentation.) (Telemetering, Telemetering systems.) *Balloons, Balloon launchers, Atmosphere models.

AD-271 137 Div. 30, 2
(TISTP/FR) OTS price $1.60

Aerophysics Lab., Mass. Inst. of Tech., Cambridge.
FURTHER BACKGROUND STUDIES WITH THE 60 INCH SEARCHLIGHT.
Final rept.,
by Charles W. Haldeman. Aug 61, 13p. incl. illus. tables, 1 ref. (Technical rept. no. 17)
(Contract AF 19(604)4547, Proj. 6770)
(AFCRL-1072) Unclassified report

DESCRIPTORS: (*Night sky, Luminescence, Infrared radiation, Measurement by *Photometers in Aircraft searchlights.) (Photomultipliers, Cooling.) Rotary shutters, Light communication systems.

A method is given for determining the frequency spectrum of the sky background by analyzing the output of the photomultiplier tube when a sinusoidal chopper is used. Design of the chopper is discussed. The photomultiplier tube detection circuit was refrigerated and the results on system performance were estimated. (Author)

AD-271 365 Div. 30, 27, 17
(TISTM/EJH) OTS price $11.50

Ohio State U. Research Foundation, Columbus.
X-RAY IMAGE SYSTEM FOR NONDESTRUCTIVE TESTING OF SOLID PROPELLANT MISSILE CASE WALLS AND WELDMENTS,
by Robert C. McMaster, Merle L. Rhoten, and Jay P. Mitchell. June 61, 144p. incl. illus. tables, 12 refs.
(Contract DA 33-019-ORD-3383, Proj. 5B93-32-004)
(WAL TR 142.5/1) Unclassified report

DESCRIPTORS: (*Non-destructive testing, *X-ray photography, Radiographic analysis, Steel, Glass textiles, Welded joints, Metal joints, Rocket cases, Reliability, Sensitivity.) (Television equipment, Camera tubes, Image intensifiers (Electronics), Photoelectric materials, Selenium, Beryllium, Gold.)

A vidicon X-ray image enlargement system for inspection of missile case walls and weldments was developed for in-motion examination of steel missile case materials and weldments, up to 1/4 in. in thickness, with 2% penetrameter sensitivity and 1/1000 in. detail resolution. X-ray images are detected directly by vidicon camera tubes with 3/8 by 1/2 in. sensing areas, and enlarged through 525-line closed-circuit television systems and 17 in. kinescope picture tubes to provide 32X images of fine details. Tests of the inspection system with missile case materials and weldments showed fine cracks, porosity, inclusions, and other discontinuities, with sensitivities comparable to optimum film radiography with fine-grain, high-contrast, Class I X-ray films. The system offers these potential advantages over X-ray film inspection: production of enlarged images suitable for direct viewing; elimination of costs of X-ray film and processing; immediate interpretation during in-motion inspection; and flexibility in control of inspection conditions. (Author)

AD-271 430 Div. 30, 15, 9
(TISTP/TL) OTS price $1.60

Naval Ordnance Test Station, China Lake, Calif.
EVALUATION OF INTEGRAL OF ELLIPTIC GAUSSIAN DISTRIBUTION OVER A CENTERED ELLIPSE,
by J. G. Waugh. 5 Sep 61, 18p. incl. illus. tables, 13 refs. (NOTS TP 2766)
(NAVWEPS rept. no. 7782)
Unclassified report

DESCRIPTORS: (Integrals, *Statistical distributions, Statistical processes.) (Probability, Mathematical prediction, Bessel functions, Impact shock, Tables.) (Guided missile research, Target position indicators.)

The integral of the elliptic Gaussian distribution over a centered ellipse may be evaluated after simple preliminary transformations from tables of the circular coverage function. The probable value of the distribution over a centered but randomly oriented ellipse where all orientations are equally probable may be evaluated from an integral involving the circular coverage function. (Author)

AD-271 506 Div. 30, 7, 14
(TISTM/GEC) OTS price $2.60

Physics Lab., Aeronautical Systems Div., Wright-Patterson Air Force Base, Ohio.
CONSTRUCTION AND CALIBRATION OF A HALL-EFFECT GAUSSMETER.
Rept. for Aug 60-Feb 61 on Applied Research in Electrical, Electronic and Magnetic Materials, by Karl Strnat and Robert A. Wolf. Nov 61, 18p. incl. illus. 2 refs.
(Proj. 7371)
(ASD TR 61-273) Unclassified report

DESCRIPTORS: (*Magnetometers, Design, Calibration.) (Magnetic fields, Theory, Hall effect, Mathematical analysis.) (Indium compounds, Arsenides, Sensitivity to Magnetic fields.) *Laboratory equipment.

The design and construction of a laboratory gaussmeter for quick measurement of steady magnetic fields is described. The instrument was battery-powered. When used with a Siemens millivoltmeter as the indicating instrument, the gaussmeter has three ranges (7.5, 15 and 30 kilogauss full scale) with an accuracy of + or - 1%. The instrument is fully portable. A Hewlett-Packard VTVM can be used alternately as the indicator. This made six more ranges available, 3000, 1000, 300, 100, 30 and 10 gauss, with an accuracy of about + or - 5%. Ranges of 3 and 1 gauss can be used for rough field estimates only. The VTVM requires line power. The In-As probe had good temperature stability and integrated over an area as small as 2 sq mm. The meter incorporates a probe current stabilization circuit to reduce the scatter in field mapping. In the upper ranges, the meter was calibrated against a nuclear magnetic resonance gaussmeter. Calibration curves are presented and should be referred to if the meter is used for accurate measurements. (Author)

AD-271 545 Div. 30
(TISTP/FR) OTS price $1.10

Aerospace Information Div., Washington, D. C.
APPARATUS FOR MEASURING THE SPECTRAL COMPOSITION OF RADIATION.
23 Jan 62, 5p. incl. illus. (AID rept. 62-9; Trans. of Vsesoyuznoye Soveshchaniye Po Svetovomu Klimatu. 2d, Moscow, 1960. Trudy (Transactions of the Second All-Union Conference on Illumination Conditions). Moskva, Gosstroyizdat, pp. 19-31, 1961)
Unclassified report

DESCRIPTORS: (*Spectrophotometers, Reflectometers.) (*Photomultipliers with Amplifiers.)

Instruments were prepared for studying the spectral composition of total and diffused radiation, spectral brightness, transparency of atmospheric layers, and spectral albedo by adding accessories of already existing lot-produced optical instruments. (Author)

AD-271 548 Div. 30
(TISTB/AW) OTS price $5.60

Farrington Electronics, Inc., Alexandria, Va.
PRINT READER MX2021( )/G TESTS AND EVALUATION, by J. H. Corbett, Jr. and H. W. Silsby. 1961, 70p. incl. illus. tables.
(Contract AF 30(602)2542)
(RADC TDR 61-319) Unclassified report

DESCRIPTORS: (*Reading machines, Optical equipment, *Communication systems, Teletype systems, Data transmission systems, Effectiveness, Errors, Design, Tests, Analysis.)

Print Reader MX2021( )/G was developed to punch teletype message tapes in a prescribed format by feeding and optically reading messages typed on a prescribed message-form; by looking up routing indicators for selected addresses, and by arranging preamble and suffix data into the prescribed output format. The study was broken down as follows: collect reading accuracy statistics to examine the accuracy of the Print Reader; assay the worth of the Print Reader's automatic addressing feature for placing routing indicators in the message tape; investigate the physical characteristics of the messages to determine the types of paper, typewriters, ribbons and format best suited to a Print Reader operation; determine processing speeds; and research the operational procedure. (Author)

AD-271 562 Div. 30, 25
(TISTM/GEC) OTS price $1.10

Lund U. (Sweden).
CELL COMPARTMENT FOR USE AT LIQUID NITROGEN TEMPERATURE IN A DOUBLE - BEAM SPECTROPHOTOMETER, by Kj. Rosengren, S. Sunner, and D. Timm.
15 Sep 61, 6p. illus. 13 refs. (Technical note no. 5)
(Contract AF 61(052)46)
(AFOSR-1831) Unclassified report

DESCRIPTORS: (*Spectrophotometers, *Ultraviolet spectrophotometers, Design, Materials, Quartz, Low temperature research.) Sweden.

A thermally insulated cell compartment accommodating two identical quartz cells, path length less than or equal to 20 mm, was constructed with which it was possible to work uninterruptedly (without refilling) at liquid N temperature for at least three hours. The compartment was used together with a Unicam model SP 700 UV to near IR spectrophotometer. (Author)

AD-271 563 Div. 30, 4
(TISTM/GEC) OTS price $1.60

Lund U. (Sweden).
AN EXPERIMENTAL APPROACH TO THE STUDY OF RADICAL FORMATION AND RECOMBINATION PROCESSES, by Kj. Rosengren, S. Sunner, and D. Timm.
15 Sep 61, 8p. illus. 15 refs. (Technical note no. 6)
(Contract AF 61(052)46)
(AFOSR-1832) Unclassified report

DESCRIPTORS: (*Photolysis, Organic solvents, Methyl radicals, Pentanes, Carbon compounds, Sulfides, Ethyl radicals, Iodides.) (*Spectrophotometers, Design, Low temperature research, *Thermochemistry, *Chemical bonds, *Recombination reactions, *Free radicals.) Sweden.

An instrumental design was described for the irradiation of light absorbing substances and for the recording of spectra of their decomposition products in a rigid matrix at 77 K, using high pressure Hg lamps and a double-beam recording spectrophotometer. The performance of the assembly was tested by photolyzing CS2 and ethyl iodide. (Author)

AD-271 640 Div. 30, 32
(TISTP/FR) OTS price $28.50

Washington U., Seattle.
TRANSLATION STUDY.
Final rept., Oct 59-Aug 61,
by David L. Johnson, Dean W. Lytle and others.
28 Aug 61, 661p. incl. illus. tables.
(Contract AF 30(602)2131)
(RADC TR 61-235)
Unclassified report

DESCRIPTORS: (*Machine translation, *Statistical analysis, Digital computers, Programming.)

Means of evaluating certain facets of the mechanical translation process were developed. These qualitative evaluation techniques are not completely general, but allow a measure of evaluation which is valid and reflects the over-all translation quality of mechanical translations in their current state. The experimental work was performed using an IBM 709 digital computer. A quality measure of a mechanical translation process is possible and feasible by mechanized means. Through comparison of the untranslated text with the translation output, the kernel analysis provides, in a single figure of merit, a measure of readability, grammatical reliability, and completeness of translation lexicon. (Author)

31. SHIPS AND MARINE EQUIPMENT

AD-271 089 Div. 31, 9
(TISTP/WH) OTS price $3.60

David Taylor Model Basin, Washington, D. C.
BACKING CHARACTERISTICS OF SUPERCAVITATING PROPELLERS,
by Richard Hecker and N. A. McDonald. Jan 62,
3p. illus. tables, 5 refs. (Rept. no. 1604)
Unclassified report

DESCRIPTORS: (*Marine propellers, Cavitation, Thrust.)

The test results generally followed the same trend in the backing condition as in the ahead condition. That is, the thrust and torque coefficients descreased with decreasing cavitation number. The decrease was more pronounced than in the ahead condition and from an examination of the photographs in many cases both sides of the propeller blade were covered or partially covered with cavitation. Considering that the blunt trailing edge acts as the leading edge in the backing condition, severe cavitation is to be expected. (Author)

AD-271 093 Div. 31, 23
(TISTB/CCH) OTS price $3.60

Duntley, S. Q., La Jolla, Calif.
NOMOGRAPHS FOR CALCULATING VISIBILITY BY SWIMMERS. I. NATURAL LIGHT.
10 May 58, 19p. illus. table (Rept. no. 3-1)
(Contract NObs-72039, Proj. NS 714-100)
Unclassified report

DESCRIPTORS: (*Nomographs, *Visibility, *Swimming, Measurement.) (Instrumentation, *Water, Vision, Mathematical analysis.) (*Visual perception, Space perception.)

AD-271 369 Div. 31, 8
(TISTE/GEC) OTS price $11.00

Sperry Gyroscope Co., Syosset, N. Y.
MANEUVERING CHARACTERISTICS OF THE MARINER TYPE SHIP (USS COMPASS ISLAND) IN CALM SEAS.
Final rept.,
by R. V. Morse and D. Price. Dec 61, 1v. incl. illus. tables, 14 refs. (Pub. no. GJ-2233-1019)
(Contract Nonr-306100)
Unclassified report

DESCRIPTORS: (Naval vessels, *Cargo ships, Inertial guidance, Instrumentation.) (Tests, *Maneuverability, Acceleration, Deceleration, Velocity, Ship hulls, Stability, Mathematical analysis.)

The results of an analytical and full scale trial investigation of the calm sea maneuvering characteristics of a Mariner class ship, the USS Compass Island (EAG 153) are presented. The availability of an inertial navigator on the ship enabled the determination of transverse velocity and drift angle in various maneuvering situations. Maneuvering data were obtained in 540 degree turning circles over a broad range of approach speeds and rudder angles. Z-maneuvers were performed at several speeds and deceleration/acceleration characteristics were investigated. Dieudonne Spiral maneuvers performed at two speeds indicated a slight directional instability of the hull. Analysis of the data included the development of equations of motion for the ship in the maneuvering degrees of freedom (yaw, sway, and surge). A signal square-law nonlinearity introduced into the yaw equation provided excellent correlation between calculated and empirical data in steady turning and also predicted the existence and characteristics of the Dieudonne loop of instability including parametric solutions for the loop height and width. (Author)

AD-271 460 Div. 31, 9
(TISTE/NTM) OTS price $4.60

J. G. Engineering Research Associates, Baltimore, Md.
THEORETICAL DEVELOPMENTS IN THE VIBRATIONS AND ACOUSTIC ANALYSIS OF HULLS,
by Joshua E. Greenspon. Dec 61, 36p. incl. illus. (Technical rept. no. 2)
(Contract Nonr-286200)
Unclassified report

DESCRIPTORS: (*Submarine hulls, Vibration, Pressure, *Acoustic impedance, Theory.) (Ship hulls, Ship models, Structural shells, Cylindrical bodies, Stresses, *Hydrodynamics, Acoustics, Integral equations, Functions, Trigonometry.)

Efforts are being made to develop a general shell type method that can be applied to the vibration and acoustic analysis of ship and submarine hulls; one in which the displacements, frequencies and sound field can be obtained by use of digital computer calculations. The method that was developed to obtain the hull stiffness char-

acteristics does not make any assumption regarding the shape of the structure but divides the structure into rectangular stiffened plate elements, bar elements and added mass elements. The external forces on the shell include the forces due to machinery, propeller, etc. plus the pressure due to vibration of the hull in the water. The resulting set of equations that the computer must solve for the amplitudes of each of the elements is a coupled set which involves the mass and elastic properties of the shell, the elastic characteristics of the mountings for the rigid masses, the mass and moment of inertia of the rigid masses and the forces induced on the hull. The computer will determine the amplitudes of vibration of the elements and masses under the given force system. The pressure on the outside of the hull can then be computed directly, knowing the amplitude and the mutual impedances of the hull elements. (Author)

32. MISCELLANEOUS ARTS AND SCIENCES

AD-271 013 Div. 32
(TISTP/WH) OTS price $2.60

California U., Berkeley.
ON AN AKERMAN-WICSELLIAN MODEL OF CAPITAL ACCUMULATION,
by Takuma Yasui and Hirofumi Uzawa. 1 Nov 61, 21p. incl. illus. 5 refs. (Technical rept. no. 3)
(Contract Nonr-22277, Proj. nos. NR-047-029 and NR-047-004)
Unclassified report

DESCRIPTORS: (*Economics, Costs.) (Statistical analysis, Special functions, *Management engineering.)

AD-271 045 Div. 32, 30
(TISTW/EET) OTS price $1.10

Lockheed Microsystems Electronics, Palo Alto, Calif.
MISSION SUCCESS AND COST ANALYSIS BY FLOW GRAPHS,
by W. W. Happ. 1961, 9p. incl. illus. 14 refs. (Rept. no. LMSC 3-38-61-7)
Unclassified report

DESCRIPTORS: (Electronic equipment, Reliability, *Statistical analysis, Mathematical prediction, *Topology, Costs, Analysis, Electronic systems.)

Flow graphs are suited to formulate and analyze mission-success cost, reliability and engineering factors such as thrust, load, mission distance. Flow graphs provide: (1) a realistic model as detailed as needed for a specific purpose; (2) modular building blocks for constructing flow graphs of complex systems; (3) an orderly logical formulation for proceeding from component to subsystem to system; (4) a graphical representation of functional dependence which clearly distinguishes between dependent and independent variables; (5) techniques for alternative formulation by elementary flow graph transformations or by topological equivalence as required in synthesis procedures; (6) a design aid which permits the effects of parameter variations on the system response to be ascertained by inspection; (7) a quantitative results obtainable by clearly defined operations; and (8) transfer of a large volume of detailed information. (Author)

AD-271 138 Div. 32
(TISTB/MS) OTS price $1.60

Civil Aeromedical Research Inst., Oklahoma City, Okla.
AN ANALYSIS OF SITTING AREAS AND PRESSURES OF MAN,
by J. J. Swearingen, C. D. Wheelwright and J. D. Garner. Jan 62, 10p. incl. illus. tables, 1 ref. (Rept. no. 62-1)
Unclassified report

DESCRIPTORS: (*Body weight, Body, Pressure, Distribution.) *Anthropometry.

Studies of sitting area on a plane rigid surface for a group of 104 male subjects were made. Area was found to vary with height and weight and to increase with age up to 40 years after which there is a steady decline. Means were 179.4 sq. in. for area and .92 pounds/sq. in. for average pressure. Sitting contact area was found to increase with experimentally apllied force of magnitudes up to something less than body weight. Analysis of pressure distribution in the sitting area reveals that nearly half of the body weight is supported on 8% of the sitting area. This high pressure area is under or adjacent to the ischial tuberosities. Over one-third of the body weight on the sitting area is removed by the addition of a footrest, chair arms, and a slightly sloping seat back. (Author)

AD-271 178 Div. 32
(TISTW/EET) OTS price $17.50

Air Force Cambridge Research Labs., Bedford, Mass.
PREDICTIVE SYNTACTIC ANALYSIS.
Comprehensive rept.,
by Murray E. Sherry. Sep 61, 1v. incl. tables. (Rept. no. AFCRL-713)
(Proj. 5632) Unclassified report

This report was originally published as rept. no. NSF-7 on Mathematical Linguistics and Automatic Translation to the National Science Foundation by the Computation Laboratory of Harvard University.

DESCRIPTORS: (Analysis of Automatic, *Language, Translations.) Dictionaries, Programming, Coding, *Machine translation, USSR, Data processing systems.

Predictive syntactic analysis is a scheme for the automatic syntactic analysis of natural language that is based on a continuous left-to-right scan of a sentence. This report supersedes previous reports on the experimental predictive syntactic analysis program for Russian. All the grammatical rules followed by the experimental program are here included. This paper is intended to serve at this time both as a report of past accomplishments and as a working paper on which to base future research. (Author)

AD-271 600 Div. 32, 30
(TISTP/MFA) OTS price $9.60

Armed Services Technical Information Agency, Arlington, Va.
LANGUAGE ORIENTED RETRIEVAL SYSTEMS,

33. TRANSPORTATION

by Paul H. Klingbiel. Feb 62, 105p. incl. illus. refs.

Unclassified report

DESCRIPTORS: (*Documentation, *Data processing systems, Language, Mathematical analysis, Algebra, Theory.)

This theoretical study is divided into three major areas: syntax, semantics, and pragmatics. These terms are used in the sense usually employed by what was once called logical positivism. Syntax, then, is concerned with a system of formal rules; semantics adds content to the symbolism; and pragmatics introduces the human element. The three parts were written independently and are published in the original version. The prologue and epilogue provide a brief statement of the author's current position. (Author)

AD-271 585 Div. 33, 30
(TISTP/FR) OTS price $14.00

California U., Los Angeles.
AN ENGINEERING ANALYSIS OF CARGO HANDLING. VIII. INFORMATION-COMMUNICATION NETWORK. DOCUMENTATION SIMPLIFICATION, INTEGRATION, AND AUTOMATION, by Louis A. Selogie. Dec 61, 209p. incl. illus. tables, 112 refs. (Rept. no. 61-65) (Contract Nonr-23307)

Unclassified report

DESCRIPTORS: (*Cargo, *Handling, *Records, Statistical analysis.) (Data processing system, Digital computers.)

32. MISCELLANEOUS ARTS AND SCIENCES

NON-MILITARY AND OLDER MILITARY RESEARCH REPORTS

*Descriptors marked with an asterisk are included in the subject index.

BIBLIOGRAPHY

OTS SB-477 $0.10

Office of Technical Services, Dept. of Commerce, Washington, D. C.
JAPANESE SCIENCE AND TECHNOLOGY. July 61, 37p. 703 refs. OTS Selective Bibliography SB-477.

DESCRIPTORS: Biology, *Science, Behavior, Chemistry, Chemical engineering, Earth, Engineering, Food, Fishes, Agriculture, Machines, Materials, Metallurgy, Physics, Mathematics, Patents, Translations, Japan, *Bibliography.

Lists 703 references added to the OTS collection during the period January 1959-July 1961. Reports are listed in the following categories: biological and behavioral sciences; chemistry; chemical engineering; earth sciences; engineering; food, fish and agriculture; machinery; materials; metallurgy; physics and mathematics; patents. These translations cover a vast body of research done in Japan and is the first compilation of this type for this country.

AGRICULTURE

ANL-6470 $3.00

Argonne National Lab., Ill.
SOIL TEMPERATURE AND WEATHER CONDITIONS, by James E. Carson. Rept. on Contract W-31-109-eng-38. Nov 61, 245p. 190 refs.

ASTRONOMY

Astrophysics

PB 159 557 $1.10

Australian National U. [Canberra].
AN ABSOLUTE ISOPHOTOMETRY OF THE SOUTHERN MILKY WAY AND TWO FIELDS IN ORION, by Hugh M. Johnson. Final rept. on Contract Nonr-2746(00). [1960] 4p.

DESCRIPTORS: *Photometers, *Galaxies, Astronomical cameras, Astronomy.

PB 156 620 $1.10

Microwave Lab., Stanford U., Calif.
ELECTRODYNAMIC PROBLEMS OF ASTROPHYSICS, by P. A. Sturrock. Technical status rept. no. 2, 1 Jan-31 Mar 61, on Contract AF 49(638)342. May 61, 6p. 9 refs. M. L. rept. no. 818.

DESCRIPTORS: *Astrophysics, *Solar flares, Solar corona, *Plasma physics, Magnetic fields, *Terrestrial magnetism, *Interstellar matter, Solar atmosphere, Magnetohydrodynamics, Electromagnetic waves.

Contents:
On the spectral characteristics of type II solar radio bursts
Interaction between the interplanetary plasma and the geomagnetic field

PB 156 369 $3.60

Oslo U. (Norway).
STUDIES OF THE EXCITATION OF AURORA BOREALIS. II. THE FORBIDDEN OXYGEN LINE, by A. Omholt. Scientific rept. no. 5, on Contract AF 61(514)1123. 1959, 38p. 63 refs. AFCRL-TN-60-288.

DESCRIPTORS: * Aurorae, Spectrographic analysis, Luminescence, Excitation, Intensity, Spectrophotometers, Photometers, Electrons, Oxygen, Statistical analysis.

Excitation and deactivation of the forbidden oxygen lines is studied theoretically with emphasis on excitation by secondary electrons and discharge mechanisms. The computed value of the intensity ratio I (5577)/ I (4709) for excitation by secondary electrons is of the same order of magnitude as observed in aurorae. Discharge mechanisms are probably not able to contribute significantly to the auroral excitation, but the possibility that the horizontal currents responsible for the magnetic perturbations associated with aurorae contribute to some extent cannot be dismissed. Other indirect excitation mechanisms and deactivation mechanisms for the excited atoms are briefly reviewed. (Author)

BEHAVIORAL SCIENCES

AD-268 172 repriced $1.50

Research Center for Mental Health, New York U., N. Y.
A COMPARISON OF ISOLATION EFFECTS AND THEIR PERSONALITY CORRELATES IN TWO DIVERGENT SAMPLES, by Leo Goldberger and Robert R. Holt. Final rept. on Biophysics of Flight, Contract AF 33(616)6103. Aug 61, 53p. 22 refs. ASD Technical rept. 61-417.

DESCRIPTORS: *Space flight, Privation, Psychology, Biophysics, Personality, Personality tests, Statistical analysis, Statistical functions, *Sensory deprivation.

Findings are reported from a pair of replicated studies using male subjects and conditions of perceptual isolation (sensory deprivation) similar to those used in the McGill studies. The first group consisted of fourteen under-graduates; the second group consisted of sixteen unemployed actors. All subjects were put through an intensive multiform assessment, which included a battery of objectively scorable tests, plus qualitative data from projective techniques, interview, and autobiography. Reactions to the altered sensory environment, which the subjects experienced for eight hours, were judged from the typed protocols of their verbalizations during the period of confinement. In all, fourteen dependent variables were derived from the protocols. These were then intercorrelated, and both the individual variables and their syndromes were related to the variables from the personality assessment. First the general group phenomena, then the patterns of correlations are discussed, with the special emphasis on those that were replicated. Implications for space flight are discussed in terms of the nature of the sensory alteration involved and other specific aspects of the experiment. (Author)

BIOLOGICAL SCIENCES

Radiobiology

ACRH-16 $2.75

Argonne Cancer Research Hospital, Chicago, U., Ill.
SEMIANNUAL REPORT TO THE ATOMIC ENERGY COMMISSION, ed. by Leon O. Jacobson and Margot Doyle. Rept. on Contract AT(11-1)-69. Sep 61, 154p. 270 refs.

BNL-675(C-31) $3.00

Brookhaven National Lab., Upton, N. Y.
BROOKHAVEN SYMPOSIA IN BIOLOGY NO. 14. FUNDAMENTAL ASPECTS OF RADIOSENSITIVITY. Rept. of symposium held June 5-7, 1961. 312p.

PB 159 147 $2.60

Naval Radiological Defense Lab., San Francisco, Calif.
COMPARATIVE MORTALITY FOLLOWING PARTIAL AND WHOLE BODY IRRADIATION OF RATS WITH FAST NEUTRONS AND X-RAYS, by M. N. Swift and S. T. Taketa. 18 Aug 60, 24p. 24 refs. Research and development technical rept. USNRDL-TR-456. AD-247 677.

DESCRIPTORS: *Radiobiology, Radiation effects, *Neutrons, *X-rays, *Radiation injuries, Intestine, Bone marrow.

Using acute mortality as the endpoint, the relative biological effectiveness (RBE) of simulated fission neutrons with respect to 250 KVP unfiltered X rays was determined in the rat for 3 types of exposure: (1) whole body, (2) abdomen-hindquarters only, and (3) head-thorax only. For whole body exposure, an RBE of 2.8 was obtained for both 5-day and 30-day endpoints, the former representing acute intestinal deaths only, the latter including both bone marrow and intestinal deaths. Although these RBE's were identical, neutron-irradiated rats appear to show a somewhat greater radiosensitivity of intestine relative to bone marrow than do X-irradiated rats. Thus, at any given 30-day lethal level, the proportion of rats dying early (by 5 days) is slightly greater in the case of neutron-exposed animals. Following exposure of abdomen-hindquarters only, essentially no mortality occurred after 5 days. The RBE for intestinal death in these rats was also 2.8. The RBE of neutrons for head-thorax exposure, producing oropharyngeal 9 to 16 day deaths, was found to be 3.0. (Author)

CHEMISTRY

Analytical Chemistry

NAA-SR-6804 $0.50

Atomics International, Canoga Park, Calif.
DETERMINATION OF IODIDE IN LEAD TELLURIDE SEMICONDUCTOR, by Louis Silverman. Rept. on Contract AT(11-1)-GEN-8. 15 Jan 62, 12p. 4 refs.

UCRL-6639 $1.00

Lawrence Radiation Lab., U. of California, Livermore.
SOME RECENTLY DEVELOPED CHEMICAL AND PHYSICAL ANALYTICAL METHODS, comp. and ed. by R. G. Gutmacher, J. E. Harrar, and R. K. Pearson. Rept. on Contract W-7405-eng-48. 30 Apr 61, 44p. 22 refs.

IDO-14576 $0.50

Phillips Petroleum Co., Idaho Falls.
DETERMINATION OF HEAVY WATER PURITY BY INFRARED ABSORPTION, by R. M. Abernathey and T. D. Morgan. Rept. on Contract AT(10-1)-205. 16 Jan 62, 7p.

Inorganic Chemistry

PB 159 666 $7.60

Aerojet [-General] Corp., Azusa, Calif.
A COMPENDIUM OF INFORMATION CONCERNING LITHIUM, by W. N. Burton, S. W. Coffman, and C. L. Randolph. Research technical memo 57 on Contracts N6ori-10, T.O. 1 and NOrd-9768. 16 Sep 49, declassified 11 May 56. 75p. 64 refs. ATI-92 975.

DESCRIPTORS: Bibliography, Jet engine fuels, *Lithium, Alloys, Silicon, Lithium compounds, Oxides, Hydroxides, Physical properties, Chemical

properties, Corrosion, Handling, Production, Water, Chemical reactions, Thermodynamics, Heat of formation, Heat of reaction, Enthalpy, Entropy, Vapor pressure, Temperature, Phase studies.

A search has been made for all available information which would have any direct relation to the use of lithium in jet propulsion motors. This survey was intended to supplement and evaluate critically the information already available. (Author)

PB 159 632 $1.60

Aerojet-General Corp., Azusa, Calif.
THE LINEAR VAPORIZATION RATE OF SOLID AMMONIUM CHLORIDE, by K. Bills, M. Therneau, and others. Rept. on Contract AF 18(600)1026. July 55, 13p. 2 refs. Aerojet-General TN-10; [AF]OSR-TN-55-117; AD-67 747.

DESCRIPTORS: Solids, *Ammonium radicals, *Chlorides, Vaporization, Pyrolysis.

The linear vaporization rate of compressed strands of ammonium chloride has been measured by an improved version of the hot-plate pyrolysis technique of Schultz and Dekker. (The Absolute Thermal Decomposition Rates of Solids, part I, in Fifth International Combustion Symposium, Pittsburgh, 1954, Reinhold, 1955). Between 393°K and 807°K in vacuum the rate data correspond to the Arrhenius equation $B = 1.2 \times 10^2 \exp(-13,500/RT)$ cm sec^{-1}. At atmospheric ambient pressure, rates corresponding to this equation are obtained only above the 629°K temperature at which the equilibrium decomposition pressure of NH_4Cl is exactly one atmosphere. Below 629°K at atmospheric ambient pressure, the vaporization rate is limited by diffusion of NH_3 and HCl vapor away from the decomposition interface. (Author)

IS-219 $0.75

Ames Lab., Iowa State U. [of Science and Tech.]
SOME THERMODYNAMIC PROPERTIES OF AQUEOUS SOLUTIONS OF TERBIUM, by Robert Arthur Nelson and F. H. Spedding. Rept. on Contract W-7405-eng-52. May 60, 31p. 86 refs.

Physical Chemistry

AD-271 155 $0.75

Coating and Chemical Lab., Aberdeen Proving Ground, Md.
CORRELATION OF HARD SURFACE DETERGENCY, SOIL, AND SURFACTANT, by A. Mankowich. 18 Nov 61, 21p. 6 refs. CCL #111.

DESCRIPTORS: *Detergents, Effectiveness, Surface properties, Soils, Equations, Surfaces, Cleaning, Chemical analysis, Surface tension.

In the practical detergency range between the 90% soil removal point (the CC-1 concentration) and the point at twice the CC-1 concentration (the CC-2 point), hard surface (steel) detergency (D) is a linear function of micellar solubilization (S) such that $D = K_1 S + K_2$, for glyceryl trioleate, oleic acid and lauryl alcohol soils. Equations of this form were obtained for glyceryl trioleate systems using polyethenoxyethers of nonyl phenol and tridecyl alcohol, polyoxyethylene sorbitan monolaurate, sodium dodecyl benzene sulphonate and sodium oleate. It was shown that the constants K_1 and K_2 of the detergency equation possess more than mathematical significance. Analysis of the equations for the 15, 20 and 40 ethylene oxide mole ratio adducts of nonyl phenol with glyceryl trioleate soil revealed that K_1 varied linearily with HLB of the adducts and that the K_2-log interfacial tension (at the CC-1 point) was linear. Examination of the equations for the 20, 50 and 100 mole ratio adducts of nonyl phenol with oleic acid soil indicated also that K_1 was a function of HLB and that K_2 was a function of interfacial tension (at the CC-1 point). The detergency equations of a single surfactant (sodium dodecyl benzene sulphonate) and three soils (triolein, lauryl alcohol and oleic acid) indicated K_1 was a function of soil dipole moment, and K_2 was a function of soil surface tension. (Author)

PB 159 539 $2.60

[Frick Chemical Lab., Princeton U., N. J.]
TRANSITION PHENOMENA IN EQUILIBRIUM POLYMERIZATION, by A. V. Tobolsky and A. Eisenberg. Rept. on Contract Nonr-1858(07). 20 Feb 61, 24p. 10 refs. ONR Technical rept. RLT-31; AD-251 465.

DESCRIPTORS: *Polymerization, *Styrenes, Mathematical analysis, *Sulfur, Theory, Methyl radicals, Transition temperature, Thermodynamics, Chemical reactions, *Polymers, Thermochemistry.

An exact treatment of equilibrium polymerization by the laws of mass action predicts the existence of unusually sharp transitions under certain circumstances. The complete mathematical equations for these transition phenomena, are derived and applied to the ceiling temperature of alpha-methyl styrene and the floor temperature of sulfur. The description of the transition phenomena goes beyond the discussion of Dainton and Ivin in yielding exact expressions for the polymerization degree, size distribution, and monomer concentration throughout the entire transition region. (Author)

HW-68493 $1.00

Hanford Atomic Products Operation, Richland, Wash.
OXIDATION OF GRAPHITE UNDER HIGH TEMPERATURE REACTOR CONDITIONS, by R. E. Dahl. Rept. on Contract AT(45-1)-1350. July 61, 33p. 13 refs.

UCRL-6626 $0.50

Lawrence Radiation Lab., U. of California, Livermore
ADSORPTION OF HYDROGEN ON SOLIDIFIED-GAS FILMS, by Angus L. Hunt, Clyde E. Taylor, and John E. Omohundro. Rept. on Contract W-7405-eng-48. 4 Dec 61, 25p. 11 refs.

PB 159 635 $1.10

Minnesota U. School of Chemistry, Minneapolis.
EFFECT OF ENVIRONMENT ON THE FLUORINE MAGNETIC RESONANCE IN SOLUTIONS OF POTASSIUM FLUORIDE, by Alan Carrington and Theodore Hines. Rept. on Contract AF 18(600)479. [1958] 6p. 3 refs. AFOSR-TN-58-318; AD-234 952.

DESCRIPTORS: *Potassium compounds, Fluorides, *Fluorine, *Nuclear magnetic resonance, Solutions, Alcohols, Electrolytes, Temperature.

Fluorine resonance in solutions of KF was extremely sensitive to solvent, concentration, and temperature changes and to the addition of other electrolytes. A series of 0.4 M aqueous KF solutions which contained equal mole fractions of Me_2CO, PrOH, ETOH, ethylene glycol, or MeOH gave resonances which shifted to increasingly higher field in the order listed. Aqueous dioxane, iso-PrOH and MeCN indicated little or no change, while aqueous tert-BuOH had a small shift and aqueous $HCONH_2$ had a much larger shift to lower field. A plot of the shift against the mole fraction of organic solvent is linear except for solutions which contained ethylene glycol which exhibited very slight curvature. From 0.4 M to 4 M, the dimagnetic shielding decreased. A similar but considerably larger effect was found in aqueous MeOH solutions, while practically no effect was found in aqueous $HCOHN_2$ solutions between 0.8 M and 8.0 M KF. Shifts to lower field occurred at the temperature was lowered; the magnitude depended on the solvent and KF concentration. Addition of other electrolytes such as KI, KBr, KCl, and K_2CO_3 also caused shifts to lower field.

MATT-98 $3.00

Plasma Physics Lab., Princeton U., N. J.
THE THERMAL DECOMPOSITION OF LITHIUM NITRATE, by L. E. Gastwirt and E. F. Johnson. Rept. on Contract AT(30-1)-1238. Aug 61, 217p. 80 refs.

EARTH SCIENCES

Climatology and Meteorology

PB 159 630 $1.10

Army Artillery Board, Fort Sill, Okla.
SERVICE TEST OF METEOROLOGICAL BALLOON ML-541/UM, by Randolph W. Fletter. Rept. on Proj. no. FA 2059. 15 Apr 60, 10p. 7 refs. AD-236 652.

DESCRIPTORS: *Meteorological balloons, Tests, Radiosondes, Balloons.

Balloon ML-541/UM will be suitable for use by artillery to sound rapidly the atmosphere to 60,000 feet above the ground during daylight hours when minor deficiencies are corrected. Development of the following items is needed: a new hydrogen generation system; a modification kit for the Hydrogen Generator Set AN/TMQ-3; a chemical charge yielding an increased volume of hydrogen; a shroud adjustable to accommodating all standard type and developmental type rawinsonde balloons under field conditions.

BNL-697(T-239) $1.25

Brookhaven National Lab., Upton, N. Y.
A STUDY OF THE WIND PROFILE IN THE LOWEST 400 FEET OF THE ATMOSPHERE, by Irving A. Singer and Constance M. Nagle. Progress rept. no. 9, 16 May-15 Sep 61, on Contract R-65-8-99812 SC-04-91. 39p.

PB 159 592 $4.60

Marine Lab., U. of Miami, Coral Gables.
STUDIES OF THE EVOLUTION OF HURRICANE SPIRAL BANDS AND THEIR RELATIONSHIP TO OTHER SYNOPTIC STORM PARAMETERS, by H. V. Senn and H. W. Hiser. Final rept. 1 July 57-30 June 58, on Contract Cwb-9174. Rept. 8899-1; ML-18565; AD-205 540.

DESCRIPTORS: *Hurricanes, *Storms, *Meteorology, Meteorological data, Statistical analysis, Statistical functions, Meteorological radar, Radar echo areas, *Hurricane tracking.

Several hundred graphical and mathematically computed correlations are presented which strengthen earlier conclusions that spiral band crossing angles increase with radius from the storm center and with increasing surface roughness parameters which have been encountered by the storm center three hours before, and decrease with increasing band length. It is shown that the quadrants in which the eye of the storm is open provide a good indicator as to the immediate direction toward which the storm is moving. Sampling difficulties, which invalidated many of the correlations are also discussed. Preliminary results on radar echo speed and direction versus range from the storm center and echo direction versus storm quadrant are presented. A new hypothesis regarding the evolution of spiral bands is presented with evidence to support the conclusions that the bands are produced near the center of the storm and move radially outward, maintaining their quadrants of origin. Data from several hurricanes are used to illustrate this hypothesis. (Author)

ENGINEERING

PB 159 639 $2.60

David Taylor Model Basin, Washington, D. C.
DEVELOPMENT AND MODEL TESTS OF AN EFFICIENT PLANING HULL DESIGN, by Eugene P. Clement. Apr 59, 21p. 3 refs. Rept. 1314.

DESCRIPTORS: *Flying boat hulls, Design, Model tests, Hydrodynamics, *Planing surfaces.

A hull form for a stepless planing boat was designed, based upon an analysis of the results of resistance tests of a number of previous designs, and also taking into consideration the features desirable for good steering qualities and good rough-water performance. A model was built and tested, and the results were compared with the resistance data from designs which had been previously tested at the Model Basin. This comparison showed that the new design has appreciably less resistance than the earlier designs at all

except very low speeds. The new design was also tested at a wide range of hull loadings and LCG locations, and these results are presented. (Author)

ORNL-3184 $0.50

Oak Ridge National Lab., Tenn.
REMOTELY CONTROLLED SHEARING OF PIPE AND STRUCTURAL MEMBERS, by A. A. Abbatiello. Rept. on Contract W-7405-eng-26. Feb 62, 12p.

Aeronautical Engineering

PB 159 637 $1.60

David Taylor Model Basin, Washington, D. C.
THE EFFECTS OF MACHINE AND FOUNDATION RESILIENCE AND OF WAVE PROPAGATION ON THE ISOLATION PROVIDED BY VIBRATION MOUNTS, by A. O. Sykes. Jan 59, 20p. 23 refs. Rept. 1276.

DESCRIPTORS: *Vibration isolators, Effectiveness, *Vibration, Reduction, Transmission, Mathematical analysis, Wave transmission, Foundations (Structures), Machines.

The effects on the transmission of vibration through isolation mounts of machine and foundation resilience, and of wave propagation are investigated. The prediction of the effectiveness of mounts is discussed, and curves are presented for estimating their effectiveness under certain conditions. A number of conclusions are drawn relevant to the problems of mount design and selection. (Author)

PB 159 670 $8.10

Naval Air Test Center, Patuxent River, Md.
EVALUATION OF GERMAN AIRCRAFT, by J. D. Brown, F. E. Ellis, Jr. and others. Final rept. on TED Proj. no. PTR 1120. 13 June 46, 90p. 8 refs. Serial FT-C-45.

Portions of this report will not reproduce well.

DESCRIPTORS: *Aircraft, Germany, *Jet fighters, Fighters, Tests, Flight testing, Stability (Lateral), Stability (Longitudinal), Stability.

This report includes the partially completed evaluation of the Me 262 airplane and brief comments on the Ar 234 airplane.

AD-268 173 repriced $1.50

Research, Inc. [Hopkins] Minn.
CABLE AND PISTON DRAG PARAMETER INVESTIGATION FOR HYDRAULIC AIRCRAFT-ARRESTING ENERGY ABSORBERS, by Howard L. Peterson. Rept. on Contract AF 33(616)40364. June 61, 53p. 2 refs. ASD Technical note 61-65.

DESCRIPTORS: *Arresting gear, Hydraulic systems, Aircraft control cables, Pistons, Drag, Test facilities, Test equipment, Tests, Design.

An investigation was conducted to obtain information on the parameters affecting operation or control of hydraulic energy absorbers used in barrier systems. The influence of independent variables on cable drag was investigated by pulling a test cable (wire rope) through a water filled tube at velocities up to 200 feet per second. Drag forces and tube water pressures were recorded for various test configurations. The variables included water tube length and diameter, smooth and rough test cable and varying amounts of water bleed. Results were analyzed and compared with full scale barrier tests. The variation of piston drag with tube diameter was also investigated. Results, using both single and double piston arrangement were also compared to the full scale barrier tests. (Author)

Chemical Engineering

NAA-SR-6666 $0.50

Atomics International, Canoga Park, Calif.
SEPARATION OF URANIUM FROM THORIUM BY LIQUID METAL EXTRACTION THORIUM RECOVERY AND FISSION PRODUCT DISTRIBUTION, by J. D. Chilton, J. A. Hanson and others. Rept. on Contract AT(11-1)-GEN-8. 1 Feb 62, 20p. 7 refs.

GAT-T-816 $0.50

Goodyear Atomic Corp., Portsmouth, Ohio.
FLUORINE CELLS WITH PROTECTED ANODE CLAMPS, by M. R. Hertz and R. P. Nugent. Rept. on Contract AT(33-2)-1. 30 June 61, 13p. 3 refs.

HW-70791 $0.50

Hanford Atomic Products Operation, Richland, Wash.
STUDIES IN MICROMERITICS. II. THE DEPOSITION OF PARTICLES IN CIRCULAR CONDUITS DUE TO THERMAL GRADIENTS, by A. K. Postma. Rept. on Contract AT(45-1)-1350. 1 Oct 61, 13p. 4 refs.

PB 158 532 $1.60

National Institutes of Health, Bethesda, Md.
AUTOMATIC PIPETTE PLUGGING MACHINE, by Laurence R. Crisp and George F. Norris. Invention rept. 20 July 60, 11p. 6 refs.

DESCRIPTORS: *Pipettes, Safety, Automatic, Machines, Design, Cotton, Effectiveness, Laboratory equipment.

This invention relates to automatic insertion of raw cotton plugs into mouthpieces of laboratory pipettes, which protects against accidental drawing of fluid into one's mouth. It consists of automatic advance of cotton to proper length, sheering cotton from continuous length and inserting sheered length into opening of pipette mouthpiece.

IDO-14559 $1.00

Phillips Petroleum Co., Idaho Falls.
THE DEVELOPMENT OF AN AIR PULSER FOR PULSE COLUMN APPLICATION, by M. E. Weech, R. S. P'Pool, and D. K. MacQueen. Interim rept. on Contract AT(10-1)-205. 22 Sep 61, 38p.

Civil Engineering

PB 181 126-1 $6.00

Bureau of Yards and Docks, Washington, D. C.
MASONRY HANDBOOK. Engineered Performance Standards, Public Works Maintenance. Rev. Feb 61, rev. Sep 61. 457p. NAVDOCKS P-708.

DESCRIPTORS: Civil engineering, *Handbooks, Construction.

PB 181 127-1 $3.50

Bureau of Yards and Docks, Washington, D. C.
MASONRY FORMULAS. Engineered Performance Standards, Public Works Maintenance. Rev. Mar 61, rev. Sep 61, 233p. NAVDOCKS P-708.1.

DESCRIPTORS: *Civil engineering, *Handbooks, Construction

PB 181 128 $5.00

Bureau of Yards and Docks, Washington, D. C.
ROADS, GROUNDS, AND PEST CONTROL HANDBOOK. Engineered Performance Standards, Public Works Maintenance. Rev. Sep 60, rev. Jan 61 and Feb 61, 305p. NAVDOCKS P-712.

DESCRIPTORS: *Roads, *Naval shore establishments, *Pest control, *Handbooks, Maintenance.

PB 181 133 $3.50

Bureau of Yards and Docks, Washington, D. C.
WHARFBUILDING HANDBOOK. Engineered Performance Standards, Public Works Maintenance. Feb 61, 201p. NAVDOCKS P-715.

DESCRIPTORS: *Piers, Construction, *Handbooks.

AD-267 128 $5.60

Institute of Aerophysics, U. of Toronto (Canada).
WIND TUNNEL TESTS OF THE TORONTO CITY HALL, by K. Dau. July 61, 55p. 5 refs. UTIA Technical note no. 50.

DESCRIPTORS: *Wind tunnel models, Structural shells, Construction, *Structures, *Cylindrical bodies, *Buildings, Canada, Wind, Velocity, Load distribution, Pressure, Gas flow, Vortices, Tests.

Steady pressures on the walls of a City Hall model were measured in the UTIA low speed wind tunnel for 6 wind directions. Pressures were measured at 3 height stations along both the inside and outside walls of both towers by means of 240 wall pressure taps. Unsteady wall pressures were measured at 4 points on the model by embedded microphones, whenever vortex shedding occurred. Flow visualization tests were made in a small smoke tunnel. Results show that the steady pressure distribution on the outside walls resembles that on a circular cylinder, with some suction peaks attaining a value of over twice the wind dynamic pressure. The outside pressure distribution is largely responsible for the torsional wind loads on the building, whereas pressure distribution on inside walls is fairly uniform and contributes mainly to bending. The unsteady pressure measurements show that vortex shedding from the model occurs for 2 wind directions. Owing to the large difference in model and full scale, no definite conclusions are drawn as to the amplitude and frequency of vortex shedding, if any, on the full-scale building. (Author)

Electrical and Electronic Engineering

AD-267 519 repriced $3.00

Advanced Semiconductor Lab., General Electric Co. Syracuse, N. Y.
UNIQUE PHOTOVOLTAIC CELLS, by J. F. Elliott, ed. Rept. for Apr 60-May 61, on Contract AF 33(616)7183. Aug 61, 162p. 30 refs. ASD Technical rept. 61-242.

DESCRIPTORS: *Solar cells, *Photoelectric cells, Photochemical reactions, Photochemistry, Electric potential, Electric power production, Effectiveness, Surface area, Theory, Materials, Crystals, *Cadmium compounds, *Tellurides, *Nitrides, *Selenides, Films, Selenium, Silicon, Intermetallic compounds, Semiconductors, Design, Configuration.

Four major areas have been investigated in an effort to improve one or more of the following figures of merit of photovoltaic solar energy converters; power output per unit cost, weight, or surface area. Polycrystalline CdTe has been investigated as a solar cell material. The work has not established any fundamental physical reason why this material should not be useful for this purpose. Attempts to construct a composite cell from a Se, CdN, or CdSe cell in optical series with a Si cell have not produced a composite cell with efficiency greater than that of the Si cell alone. The possibility of using a variable band gap material (i.e., material that has a band gap which is a function of one of the linear dimensions of the material) for a high efficiency converter has been examined theoretically. This analysis indicates that present semiconductor materials have not reached a state of development which would permit a useful cell to be constructed. Different design considerations for a conventional silicon solar cell were studied. Several of these would apparently make second order improvements in the conversion efficiency. (Author)

PB 181 120 $4.00

Bureau of Yards and Docks, Washington, D. C.
ELECTRICAL AND ELECTRONIC HANDBOOK. Engineered Performance Standards, Public Works Maintenance. Rev. Mar 61, 291p. 29 refs. NAVDOCKS P-703.

DESCRIPTORS: *Electrical engineering, Electrical equipment, *Electronic equipment, *Handbooks.

PB 156 901 $1.60

Clevite Corp., Cleveland, Ohio.
STUDY OF METHODS FOR IMPROVING QUALITY OF SYNTHETIC QUARTZ, by D. R. Hale and A. E. Carlson. Quarterly rept. no. 1, (Rept. 13) 15 Oct 60-15 Jan 61, on Contract DA 36-039-sc-87372; Continuation of Contract DA 36-039-sc-78247. 15 Jan 61, 15p. 6 refs. AD-252 172.

DESCRIPTORS: *Quartz crystals, Quartz resonators, Growth, Production, Quality control.

Improvements now under way toward growing improved quality of quartz include growth in 0.5 M KOH. A number of experiments in operation involve growth from Corning 100% silica, Z-growth quartz, crystallized silica gel. Quartz methods of rendering dislocations in quartz crystals visible are being examined theoretically. (Author)

PB 155 373 $2.60

Eastern Rotorcraft Corp., Doylestown, Pa.
MAST AB-608 ( ) /G, by Arthur W. Smith. Quarterly progress rept. no. 1, 25 July-25 Oct 60, on Contract DA 36-039-sc-85153. Oct 60, 22p.

DESCRIPTORS: *Antenna masts, Design.

This report describes a portable, tubular telescoping, hand-air pump operated mast. Discussed are air pressure sealing problems, seal types, metal-to-metal bonding, bearing materials and weight reduction without modifying the other required characteristics. (Author)

PB 156 566 $1.60

Eastern Rotorcraft Corp., Doylestown, Pa.
MAST AB-608 ( ) /G, by Arthur W. Smith. Quarterly rept. 2, 25 Oct 60-25 Jan 61, Contract DA 36-039-sc-85153. Jan 61, 18p.

DESCRIPTORS: *Antenna masts, Design.

The following items are discussed: design of the mast collars to include an adjustable keyway; design of the mast and equipment container to an overall dimension no greater than 64 inches; urethane 286 seals for the tube heads; welding of the lock rings and tube head; metal-to-metal bonding of keys to the mast tube sections.

PB 157 776 $1.60

Eastern Rotorcraft Corp., Doylestown, Pa.
MAST AB-608 ( ) /G, by Arthur W. Smith. Quarterly rept. 3, 25 Jan-25 Apr 61, Contract DA 36-039-sc-85153. Apr 61, 16p.

DESCRIPTORS: *Antenna masts, Design.

The following items are discussed: design of the mast collars incorporating the accepted adjustable keyway design; a simplified system to align mast section keys with their respective collars; lock rings turned from the tube wall; tube heads turned after welding to tube; system used to bond the keys to the tube sections; a new equipment and accessories packaging system. (See also PB 156 566)

PB 159 628 $5.60

Electronic Defense Lab., Mountain View, Calif.
IMAGE-IMPEDANCE DESIGN OF TEM MODE MICROWAVE FILTERS, by D. V. Geppert. Rept. on Contract DA 36-039-sc-31435. 1 Nov 55, 55p. 9 refs. Engineering rept. no. EDL-E6; AD-77 948.

DESCRIPTORS: *Microwave networks, *Low-pass filters, *Band-pass filters, Electric filters, Impedance, Design, *Electromagnetic waves, Propagation, Transmission lines, Cavity resonators, Matrix algebra, Geometry.

This report presents the analysis of several filter sections consisting of combinations of lumped and/or distributed discontinuities suitable for incorporation into TEM mode microwave filters, following closely Zobel's image-parameter technique, developed originally for low-frequency lumped-constant circuits. A discussion of spurious pass bands caused by higher-order modes or by inequalities in line lengths in certain filter sections is included because of its great practical importance in the early design stages of filter problems. A section on impedance transformations, either for the entire filter or for image-impedance improvement in certain sections, is also included. A comparison is made between coaxial construction, shielded strip line construction, and a hybrid geometry using a round center conductor shielded by two parallel flat ground planes. Design data is given for these three geometries. (Author)

PB 159 623 $9.60

Electronics Research Lab., Stanford U., Calif.
PERIODIC FOCUSING OF ELECTRON BEAMS, by Casper William Barnes. Technical rept. no. 33, on Contract N6onr-25132. 3 May 54, 118p. 2 refs. AD-31 720.

DESCRIPTORS: *Electron beams, Focusing, Electric fields, Magnetic fields.

The focusing of electron beams by electric or magnetic fields which are periodic in the axial direction

was investigated for 4 specific cases: axially symmetric and quadripolar electric-field systems, and axially symmetric and quadripolar magnetic-field systems. Of the 4 focusing systems considered, the axially symmetric electric and magnetic systems appeared to be the most promising. These systems were subject to perveance-limiting effects; the electric system was much more limited than the magnetic system in this respect. The axially symmetric electric system was very sensitive to initial radial velocities in the injected beam. The theory indicated that for both of the quadripolar systems the beam is not uniformly sensitive to initial conditions around the periphery of the beam. All of the experimental results were devoted to the axially symmetric electric system. The focusing structure was adapted from the RF structure of an interdigital backward-wave oscillator. Because of the aberrations in the electron gun, the resulting beam appeared to be nonlaminar, and under these conditions the experimental results gave qualitative verification of the theory.

PB 157 387 $3.60

Electronics Research Lab., U. of California, Berkeley.
ANALYSIS OF TRANSISTOR DISTRIBUTED AMPLIFIERS, by D. O. Pederson and D. D. Thornton. Rept. on Contract Nonr-222(74). 1 Sep 60, 32p. 7 refs. Rept. no. 115; Series no. 60, issue no. 312; AD-246 172.

DESCRIPTORS: *Transistors, Amplifiers, Mathematical analysis, Design, *Distributed amplifiers.

An analysis of transistor distributed amplifiers is presented which is based on a simple circuit model for the transistor. It is shown that the effects of the output impedances of the transistor may be negligible in relation to the effects due to loss in the base line. Two values of a design parameter are proposed for the base line. One leads to an approximate constant-R line. The other provides a good delay characteristic. Amplifier-design information is derived from the analysis, and the results from experimental amplifiers using alloy and mesa transistors are given. Finally, a gain-bandwidth comparision of cascaded amplifiers and distributed amplifiers is made. (Author)

PB 157 386 $2.60

Electronics Research Lab., U. of California, Berkeley.
QUARTERLY PROGRESS REPORT NO. 30, 1 JULY-30 SEPTEMBER 1960. Rept. on Contracts Nonr-222(74, 53, 57). 31 Oct 60, 28p. 11 refs. Series no. 60 [issue] no. 30; AD-250 774.

DESCRIPTORS: *Information theory, Scattering, *Feedback amplifiers, *Electronic circuits, *Negative resistance circuits, *Amplifiers, *Transistors, *Oscillators, *Semiconductors, *Electromagnetic theory, *Electronic scanners, *Electromagnetic waves, *Waveguide slots, *Antennas, *Diodes, Conical bodies, Ferrites.

Contents:
Back-scattering from cones
Scattering from multiple targets
Scattering from materials with gyrotropic media
Radiation from a modulated ferrite traveling-wave antenna
Ferrite field-displacement device for slot-coupling control
Diffraction studies
Nonlinear semiconductor device circuitry
Network theory
Electronic circuits research
Antenna arrays from a data processing viewpoint
Information theory
Research in high-temperature semiconductor devices
(See also PB 150 791)

AD-268 590 repriced $2.50

General Electric Co., Schenectady, N. Y.
THERMOPILE GENERATOR FEASIBILITY STUDY. PART I. SUMMARY, ed. by R. L. Gessner. Final rept. 1 July 57-31 Mar 60, on Contract AF 33(616)5281. Aug 60, 103p. 2 refs. WADD Technical rept. 60-22, Part I.

DESCRIPTORS: *Thermoelectric generators, Generators, *Thermopiles, Feasibility studies, Thermoelectricity, Materials, Metals, Alloys, Transition elements, Hydrides, Semiconductors, Borides, Carbides, Silicides, Nitrides, Oxides, Titanates, Ferrites, Intermetallic compounds, Thermal conductivity, Instrumentation, Heat, Sources, Solar cells, Radioisotopes, Homogeneous reactors, Radiation hazards, Shielding, Sandwich construction, Space weapons, Power supplies, Design, Tests.
This report contains a detailed description and summary of a research and development study to determine means of employing thermopile generators as sources of electrical power in future air and space weapon systems. The following major areas of work were involved: (1) Materials development, (2) Junction fabrication and test, (3) Thermoelectric generator applications studies, and (4) Thermoelectric generator design. Part I contains a coordinated presentation and discussion of objectives, procedure, major results, and conclusions and recommendations. (Author)

AD-268 591 repriced $2.25

General Electric Co., Schenectady, N. Y.
THERMOPILE GENERATOR FEASIBILITY STUDY. PART IV. GENERATOR DESIGN, ed. by R. L. Gessner Final rept. for 1 July 57-31 Mar 60, on Contract AF 33(616)5281. Aug 60, 92p. 12 refs. WADD Technical rept. 60-22, Part IV.

DESCRIPTORS: *Thermoelectric generators, Generators, Design, Construction, Tests, *Thermopiles, Feasibility studies, Thermoelectricity, Solar cells, Sandwich construction, Fins, Materials, Diffusion, Iron, Nickel, Electrodeposition, Bonding, Flame spraying, Carbonyl radicals, Iron compounds, Sublimation, Oxidation, Adhesives, Coatings, Specifications, Model tests.

This report contains a detailed description and summary of a research and development study to determine means of employing thermopile generators as sources of electrical power in future air and space weapon systems. The following major areas of work

were involved: (1) Materials development, (2) Junction fabrication and test, (3) Thermoelectric generator applications studies, and (4) Thermoelectric generator design. Generator design contains a detailed description of the work on junction fabrication and test and on thermoelectric generator design as applied particularly to: (1) Efforts to design, build, and test a 5 watt generator model, and (2) Preparation of specifications for a 100 watt Solar Thermoelectric Generator. The actual specifications for the 100 watt Solar Thermoelectric Generator are included. (Author) (See also AD-268 590)

AD-259 035 $14.50

Hoffman Electronics Corp., El Monte, Calif.
PILOT LINE PRODUCTION OF HIGH EFFICIENCY SOLAR CELLS, by E. L. Ralph and H. F. Biekofsky. Final technical engineering rept. 9 Dec 59-6 Jan 61, on High Efficiency Silicon Solar Cells, Contract AF 33(600)40497. Mar 61, 213p. 27 refs. ASD Technical rept. Pr. 7-824.

DESCRIPTORS: *Solar cells, Manufacturing methods, *Power supplies, Light, Light transmission, Solar energy, Tests, Measurement, Diffusion, Resistance, Materials, Metals, Reliability, Temperature, Silicon, Nickel plating, Semiconductors, Solar spectrum, Phosphorus, Radiation instruments.

The limitations of silicon solar cells are discussed and four major areas of improvement are considered: optimization of the p-layer thickness and series resistance; selection of crystals with improved properties; improved handling and fabrication techniques; decreased losses due to series resistance. Various studies and experiments made in order to obtain higher efficiency solar cells are detailed. Studies are discussed which determined optimum junction depth and the diffusion parameters necessary to obtain these junction depths. Several diffusion experiments were performed and the variation of surface concentration, junction depth and the diffusion coefficient have been determined as a function of temperature. The effect of varying diffusion temperature on solar cell spectral response was investigated. Two methods of evaluating diffusions (junction depth and sheet resistance) are analyzed and experimental techniques for evaluating diffusion by these methods are discussed. (Author)

PB 159 631 $5.60

Institute of Science and Tech., U. of Michigan, Ann Arbor.
A SUBSYSTEM FOR THE DIGITAL CODING AND REMOTE DISPLAY OF CURVED LINES, by John Brown and Donald Wagner. Rept. on Proj. Michigan, Contract DA 36-039-sc-78801. Dec 60, 51p. 2900-219-T; AD-249 841.

DESCRIPTORS: *Digital computers, Coding, *Teletype systems, *Communication systems, Display systems, *Data transmission systems, Maps, Photographs, *Military intelligence.

As an outgrowth of the combat-surveiliance information-processing program of Project MICHIGAN, a concept of a simple equipment for the transmission of outline drawings such as map overlays with the aid of standard teletype equipment was developed. From a communications standpoint, this concept has the advantage of a very low redundancy, and operates readily within the very narrow bandwidth of standard teletype - not a characteristic of most pictorial-data transmission systems. A compact set of lightweight equipment for two-way transmission was constructed for demonstrating the concept's technical and tactical feasibility. This report describes the equipment and gives enough details of operating technique to permit an unskilled operator to learn its use. Some notes on maintenance are included, as well as some suggested modifications for increasing its utility. (Author)

PB 159 663 $12.50

International Resistance Co., Philadelphia, Pa.
PRECISION, HIGH STABILITY METAL FILM RESISTORS, by Warren Hobson, Jr. Final rept. on step 1, 29 June 56-31 May 59, on Precision Metal Film Resistors, Contract DA 36-039-sc-72726. 7 Dec 59, 117p. AD-232 092.

DESCRIPTORS: *Fixed resistors, Design, Production, Stability, *Metal films, Humidity, Temperature.

A manufacturing process and a pilot plant manufacturing facility were established for the production of precision, high stability metal film resistors which exceed the performance and quality level requirements of Military Specification MIL-R-10509C, Char. C. Improved materials for the components of the resistors were utilized, a production process was organized and the tests required by the contract were performed. Problems were presented by the termination resistance, the need for suitable metallic films of various ohmic ranges, and the search for an outer jacket capable of withstanding extreme humidities and temperatures. By 1958, these problems were solved on a pilot plant scale and the results were compatible with production equipment and techniques. Difficulties with the 1/8-watt units necessitated extra pilot runs. An efficient system of quality control, which was mandatory for the production of units of the quality level called for under this contract was created. (Author)

PB 159 662 $6.60

International Resistance Co., Philadelphia, Pa.
QUALITY CONTROL MANUAL. EVAPORATED METAL FILM PROCESS. Rept. on Contract DA 36-039-sc-72726. [1959] 69p. AD-232 090.

DESCRIPTORS: *Resistors, *Metal films, Evaporation, Ceramic materials, Gold, Quality control, Instruction manuals, Specifications, Manufacturing methods.

Portions of this report will not reproduce well.

Contents:
Section I
Organization
General inspection and quality control practices
Incoming material inspection
Test equipment, tools, and gages
Data feedback

Section II
Flow chart - Evaporated metal film resistors
Section III
In-process inspection by operation, items inspected, frequency and type of inspection performed, and specifications inspected.

PB 159 669 $9.10

Horizons, Inc., Cleveland, Ohio.
FREQUENCY STABILIZATION BY NON-PIEZOELECTRIC CRYSTALS, by Robert M. Ulmer. Rept. no. 4 (Final) 15 Apr-15 July 53, on Contract DA 36-039-sc-42565. 15 Aug 53, 109p. 25 refs. AD-21 720.

DESCRIPTORS: *Piezoelectric crystals, *Frequency stabilizers, Frequency, Control, Stabilization, Alloys, Brass, Crystals, Design, Electrostatics.

Frequency stabilization devices composed of non-piezoelectric materials excited electrostatically show excellent possibilities for future commercial usage as frequency controllers or narrow band filter elements. Many modes of vibration are available from cylindrical or rectangular bar, and spherical resonators. Optimum operation of these resonators occurs in vacuum (1-1000 microns). A breadboard oscillator employing a Ni Span C cylindrical resonator as the stabilizing element and a 12AX7 tube operated within the tolerance of the frequency counter (±0.1 c.p.s. at a nominal frequency of 46,171.8 c.p.s.) for a period of 15 hours with no temperature control employed. The loss of a Ni Span C cylindrical resonator was measured as low as 26 db from driving to detecting electrode. Ni Span C resonators correctly aged and treated to give increased stability have proved to be the best type tested. A comparison of Ni Span C and β-brass resonators to commercial quartz shows that, for the frequencies 10 to 100 Kc (excluding the GT cut crystal), Ni Span C probably is superior while β-brass will compare favorably when stability treatments are found.

PB 159 625 $4.60

Microwave Research Inst., Polytechnic Inst. of Brooklyn, N. Y.
CIRCULAR ELECTRIC MODE DIRECTIONAL COUPLER, by B. Oguchi. Rept. on Contract DA 36-039-sc-78001. 21 Oct 59, 45p. 9 refs. Research rept. R-786-59, PIB-714; AD-234 042.

DESCRIPTORS: *Waveguide couplers, X band, C band, Transducers, Microwaves, Propagation, Waveguide filters.

This paper describes a novel circular electric mode directional coupler, which is composed of two coaxial bifurcations in circular waveguide. The coupling coefficient of the directional coupler is widely changed by the separation between the two bifurcations, and a hybrid junction for the circular electric mode may be obtained at the proper separation. The analysis of the directional coupler is carried out in terms of scattering matrix elements characterizing each coaxial bifurcation. The scattering matrix elements were determined experimentally via the Weissfloch tangent method at C-band. For convenience, experiments on the directional coupler have been carried out in sectoral waveguide instead of circular waveguide. Measured characteristics of the directional coupler at X-band are in good agreement with values determined by circuit calculations employing parameters of the coaxial bifurcation measured at C-band. For the case of a hybrid junction, wide band matching has been accomplished and verified experimentally. Applications of this directional coupler are outlined. (Author)

PB 159 636 $5.60

Microwave Research Inst., Polytechnic Inst. of Brooklyn, N. Y.
SYMMETRY AND ASYMMETRY PARAMETERS FOR WAVEGUIDE JUNCTIONS, by Morris Cohen (Master's thesis) and Walter K. Kahn. Rept. on Contract DA 36-039-sc-78001. 10 Feb 60, 60p. 7 refs. Research rept. R-714-59; PIB-642; AD-232 734.

DESCRIPTORS: *Waveguide joints, Matrix algebra, Mathematical analysis, *Waveguide couplers, Design, Transmission lines, Waveguides.

A systematic approach is presented to the evaluation of waveguide junctions from the standpoint of their conformance to certain symmetries. Preferred sets asymmetry parameters are found which are complete, minimal in number, go to zero when the junction represented is symmetrical, and may often be identified with a corresponding structural symmetry defect. The asymmetry parameters; are first introduced for general linear junctions, but special attention is given to reciprocal and lossless junctions. The derivation of these preferred sets is based on the theory of group representations hitherto employed in the analysis of ideally symmetric junctions. Sets of parameters are tabulated for: the symmetric 2-port junction, the shunt and series-T junctions, the H-plane Y junction, the hybrid-T junction, and the symmetrical H-plane junction which includes the short-slot coupler as a special case. (Author)

PB 159 626 $9.60

Motorola, Inc., Riverside, Calif.
STUDY AND APPLICATION OF PHASELOCK LOOP TECHNIQUES TO A REMOTE TELEMETRY DATA ACQUISITION AND TRANSMISSION SYSTEM, by John Kolden. Rept. on Contract AF 04(611)3742. Feb 60, 118p. 23 refs. Rept. no. RLS-3844-5; AD-234 680.

DESCRIPTORS: *Frequency modulation, Detectors, *Servomechanisms, *Electronic equipment, *Electronic circuits, Design, *Radio receivers, *Circuits, *Data transmission systems, *Telemetering.

The study and application of phaselock loops was undertaken in an effort to improve the reception and reliability of the Remote Telemetry Data Transmission and acquisition System at Edwards Air Force Base. A phaselock loop is a linear detector for a frequency modulated (fm) signal. It is essentially an electronics servomechanism. A phase detector determines the phase difference between an fm receiver intermediate frequency (IF) stage signal and a local signal generated by a voltage controlled oscillator (VCO). This

phase difference is amplified and used to control the frequency of the VCO so that the VCO frequency is in phase coherence with the receiver IF signal. A low-pass filter in the loop prohibits the VCO from following rapid noise fluctuations; thus, the output of the VCO represents a relatively noise-free reproduction of the receiver IF signal and the input to control the VCO represents the demodulated output of the receiver IF signal. (Author)

PB 159 668 $13.00

Rensselaer Polytechnic Inst., Troy, N. Y.
AN INVESTIGATION OF PROBLEMS ASSOCIATED WITH BROADBAND INTERFERENCE MEASUREMENTS, by Kenneth E. Mortenson. Final rept. 1 Sep 52-18 Nov 55, on Contract DA 36-039-sc-42488. [1955] 182p. 34 refs. AD-85 894

DESCRIPTORS: *Broadband, Interference, Radio interference, Noise (Radio), Signal-to-noise ratio, Measurement, Instrumentation, *Antennas, Broadband antennas, Coupled antennas, Coupling circuits, Circuits, Dipole moments, Impedance, Electric fields, *Correlation techniques, *Oscilloscopes, Amplifiers, Frequency.

This report presents a summary of work done on the three approaches or techniques investigated to establish the required interference measurement systems. The first approach, the cavity technique, was initiated to provide a field free volume of space in which could be made desired noise field measurements with greater sensitivity. In the second approach, the probe technique, which provides for the direct measurement of electric fields in "free-space", a complete investigation of antenna-systems for field intensity measurement purposes was made. The third approach, the correlation technique, consisted of devising a system to improve measuring sensitivity by selecting the desired information in preference to interfering signals from the combined antenna induced voltage.

PB 159 622 $8.60

Sperry Gyroscope Co., Great Neck, N. Y.
HOLLOW-BEAM STUDY. Final engineering rept. on Contract Nonr-217(01). Oct 53, 98p. 8 refs. Sperry rept. 5270-6143; AD-21 988.

DESCRIPTORS: *Electron beams, Production, *Cathodes (Electron tubes), Klystrons, Traveling wave tubes, Magnetic fields, Circuits, Design.

Research indicated that a hollow beam should be described in terms of the ratio of the beam thickness and the proximity of the beam to its external wall to the diameter of the beam, as well as the total perveance of the beam. In order that the beam be useful for high-power applications, a cathode that is to provide the electron beam should be operated at an emission density consistent with the life of the cathode. An experimental beam with a microperveance of 10, a thickness of 1/8 the diameter, and a ratio of cathode area to beam area of 16 to 20 met all requirements. The cathode could not be designed by using the conventional means of carving a portion of a spherical beam from a known Langmuir solution for a spherical diode. A reverse-beam tester was built in order to verify each step of the theory and beam trajectory plotting. Results of these tests indicated that the uniformity of beam and alignment of the cathode are important in hollow-beam experiments. Results also showed that the simple beam trajectory tracing in a high-voltage drift tube region does not check with the calculated trajectories. An electrostatic forward-beam tester was assembled according to design and was tested. The preveance obtained was lower than the calculated value. The percentage transmission at the design potential was poor. By varying the relative potentials from the design values, the percentage transmission increased. New techniques were developed for the construction of high-power cathodes suitable for generation of a hollow beam. Knowledge of the magnetic field circuit peculiar to the hollow-beam case was advanced.

PB 159 627 $9.60

Sylvania Electric Products, Inc., Woburn, Mass.
INDUSTRIAL PREPAREDNESS STUDY: X-BAND VIDEO-DETECTOR CRYSTALS, by J. S. Epstein and K. C. C. Gunn. Final engineering rept. 1 July 57-29 Feb 60, on Contract DA 36-039-sc-75951. [1960] 114p. AD-234 898.

DESCRIPTORS: *Crystal detectors, Crystals, Detectors, X-band, *Diodes, *Manufacturing methods, Production, *Crystal rectifiers, Video signals, Silicon.

The development of a highly sensitive, ruggedized X-band video detector diode is considered. It will withstand vibration, centrifuge, temperature cycling, and burnout by pulsing tests. The diode is also hermetically sealed and will operate at 150°C. Included also are an automatic whisker welding, forming, and cut-off machine, a figure of merit and video impedance test kit, a whisker pointing and plating set-up, and a batch dice soldering apparatus. Equipment and facilities for production of these diodes are described. (Author)

Mechanical Engineering

PB 181 122 $2.00

Bureau of Yards and Docks, Washington, D. C.
HEATING, COOLING AND VENTILATING FORMULAS. Engineered Performance Standards, Public Works Maintenance. Oct 60, 78p. 5 refs. NAVDOCKS P-704.1.

DESCRIPTORS: *Mechanical engineering, *Handbooks, Heating systems, Refrigeration systems, Ventilation, Maintenance.

PB 181 121 $3.00

Bureau of Yards and Docks, Washington, D. C.
HEATING, COOLING AND VENTILATING HANDBOOK. Engineered Performance Standards, Public Works Maintenance. Sep 61, 177p. NAVDOCKS P-704.

DESCRIPTORS: *Mechanical engineering, *Handbooks, Heating systems, Refregeration systems, Ventilation, Maintenance.

Ordnance, Missiles, and Satellite Vehicles

PB 159 620 $3.60

Aberdeen Proving Ground, Md.
DESERT TESTS (1952). EXPERIMENTAL OIL FILTER GASKETS, by M. B. Heizer. Rept. no. 39, 12 May-15 Sep 52, on Proj. no. TB5-1401. 23 Sep 52, declassified. 31p. 2 refs.

DESCRIPTORS: Ordnance, Oil filters, *Rubber gaskets, Gaskets, Desert tests.

Eight experimental gaskets were installed on trucks ranging in size from 3/4-Ton to 5-Ton. These trucks were operated approximately 10,000 miles each in ambient temperatures as high as 123° F. Only one oil filter element change was made on each vehicle during the course of the operation, but at the conclusion of the test the gaskets were not considered serviceable for additional use.

PB 159 714 $13.00

Bureau of [Naval Weapons] Washington, D. C.
PREPARATION OF BUORD DRAWINGS AND LISTS. 23 Nov 59, rev. 16 Dec 59. 190p. NAVORD OSTD 599 (Second rev.)

DESCRIPTORS: *Drafting, Standards, *Weapons, Design, *Ordnance, Military requirements.

The Bureau of Ordnance has developed a system for the documentation of technical information concerning weapons from the research stage through service maintenance and use. A major portion of the documentation concerns item description, inspection, and manufacture. Documentation of the description, required inspection and tests, and special tests, is provided by specifications, lists of drawings (including parts lists), and drawings. This standard states the requirements for the preparation of the drawings and lists of drawings that, together with specifications, complete the documentation.

PB 159 715 $2.60

Detroit Arsenal, Center Line, Mich.
COLD TEST OF CARRIAGE, MOTOR, 90-mm GUN, M56, by Jimmie B. Harvin. 17 June 57, 23p. Rept. no. 3874 (Final); AD-135 844.

DESCRIPTORS: *Self-propelled guns, Guns, Climatic factors, Test methods, Test equipment, Tests, Temperature, Exposure.

Each recirculation system was tested at temperatures of plus 30°F and 0°F. After the elimination of Code "B" system because of adverse cooling tendencies, the Code "A" system was further tested at temperatures of 0°F, minus 25°F and minus 40°F. The sensing tubes of the servo control mechanism were relocated from the top of the cylinders to the bottom of the cylinders to effect a more accurate sensing of the cylinder temperatures. With the relocation of the sensing tubes, the engine cylinder temperature did not exceed 480°F. Engine and transmission oil temperatures did not exceed 180°F and 215°F respectively. Tests were discontinued after engine failure at minus 65°F. (Author)

AD-267 876 repriced $0.75

Naval Ordnance Lab., White Oak, Md.
CHARACTERIZATION OF SQUIB, MK 1 MOD O: THERMAL STACKING FROM RADAR-LIKE PULSES, by L. D. Hampton and J. N. Ayres. 15 Sep 61, 28p. 3 refs. NOLTR 61-108.

DESCRIPTORS: Ordnance, Naval ordnance, Electromagnetic waves, Wave transmission, Hazards, *Electric detonators, Radar pulses, Detonation, Wire, Tests, Temperature.

The electro-thermal equations describing the heating and cooling of wire bridge electro-explosive devices are solved for constant-current radar-type input pulses. The bridgewire temperature-time history is obtained for a variety of pulse amplitudes and repetition frequencies. Equilibrium temperatures are obtained for the varied input conditions and are all combined in a single nomograph. If the hot-spot theory is assumed the conditions for explosion can be deduced. For instance, for the Mk 1 Squib, a temperature rise of 500°C will result if the value of I^2R is 1,000 microjoules at a very low pulse repetition frequency (below 60 cps.) or is 100 microjoules at a frequency of 2,000 cps. This temperature rise would be expected to cause the squib to fire approximately 50% of the time. (Author)

AD-267 520 repriced $4.00

Northern Research and Engineering Corp., Cambridge, Mass.
ENGINEERING STUDY OF VAPOR CYCLE COOLING EQUIPMENT FOR ZERO-GRAVITY ENVIRONMENT, by Kymus Ginwala. Rept. for 1 Oct 59-31 Aug 60, on Contract AF 33(616)6783. Jan 61, 260p. 224 refs. WADD Technical rept. 60-776.

DESCRIPTORS: Satellite vehicles, Space probes, *Spaceships, Vapors, Cooling, *Refrigeration systems, *Coolants, *Refrigerants, Design, Weightlessness, Thermodynamics, Enthalpy, Entropy, Theory, Mathematical analysis, Heat exchangers, Heat transfer, Thermal radiation.

This report discusses the results of an analytical and experimental study of space vehicle vapor cycle cooling systems operating in a zero-gravity environment.

The evaporator temperature varied from 40 to 55 degrees F, and the condenser temperature varied between 150 and 250 degrees F; the evaporator cooling load varies from 400 to 4000 BTU/min. The ultimate heat dissipation is by radiation to space. The operation of a vapor cycle in a zero-gravity environment was considered with emphasis on the vapor-liquid separation problems in evaporation and condensation. The vortex evaporator is presented as a solution to the zero-gravity evaporation problem. The spiral condenser is presented as a solution to the zero-g condenser problem. An analysis for and design of a rotating condenser is shown before any reliable design and construction of a wick evaporator is possible. Film condensation under zero gravity in the laminar region is also analyzed. For vapor cycles operating at large differences in condenser and evaporator temperature, the substitution of an expansion engine for the throttle valve results in a significant improvement in the cycle performance. (Author)

PB 159 634-1 $11.50

Northrop Corp., Hawthorne, Calif.
HYPERENVIRONMENT SIMULATION. PART I: DEFINITION AND EFFECTS OF SPACE VEHICLE ENVIRONMENT NATURAL AND INDUCED, by T. M. McCoy. Rept. on Contract AF 33(616)6679. Jan 61, 157p. 166 refs. WADD Technical rept. 60-785, Part I; AD-254 077.

DESCRIPTORS: *Space environmental conditions, Scientific research, Spaceships, Atmosphere, Space flight, Astronautics, *Planetary atmospheres, *Upper atmosphere, Moon, Van Allen radiation belt. Ionosphere, Stratosphere, Simulation, *High altitude, Re-entry aerodynamics.

Contents:
Definition and Effects of the Natural Hyperenvironments: Atmospheric composition; Low pressure; Thermal energy regimes; Electromagnetic radiation; Particle radiation; Solid particles; Gravitational fields; Magnetic fields; Secondary natural phenomena; Venusian atmosphere; Martian atmosphere; and Lunar atmosphere. Definition and Effects of the Induced Hyperenvironments: Kinematic environment; Sustained acceleration; Mechanical shock; Vibration; Acoustics; Thermal extremes; Dissociation and ionization; Magnetic fields; and Nuclear radiation.

SCTM-37-61(73) $1.60

Sandia Corp., Albuquerque, N. Mex.
METHODS AND CONCEPTS IN ACOUSTICAL ENVIRONMENTAL TESTING, by R. I. Butler. Feb 61, 16p.

Sanitation and Safety Engineering

TID-5360(Suppl. 3) (Rev.) $0.75

Atomic Energy Commission. Div. of Technical Information Extension, Oak Ridge, Tenn.
A SUMMARY OF INDUSTRIAL ACCIDENTS IN USAEC FACILITIES. Dec 61, 38p.

AD-268 574 repriced $2.00

Battelle Memorial Inst., Columbus, Ohio.
A STUDY OF RELIABILITY OF FLIGHT-VEHICLE FIRE-PROTECTIVE EQUIPMENT, by H. Cary, J. L. Easterday and others. Final rept. 10 Nov 60-30 Apr 61, on Phase II of Contract AF 33(616)7306. Sep 61, 71p. 5 refs. ASD Technical rept. 61-65.

DESCRIPTORS: *Aircraft fires, Detection, Hazards, *Fire detectors, *Fire extinguishers, Reliability, Design.

The objective of the total program was to analyze existing fire-detection and fire-extinguishing systems and components to determine deficiencies from a reliability standpoint, and to determine design criteria to insure high reliability in fire-protection equipment for use in future flight vehicles. Fire hazards must be identified during a design and hazard study of the preliminary weapon-system design. Materials characteristics must be assessed and a fire-hazard index estimated. The risks of using or not using a fire-protection system must be studied. A technique for justifying the use of fire-protection equipment is described, as is a means of optimizing fire-detection characteristics. Flow charts and supporting text point out the decision procedures and background information for: (1) deriving fire-protection-system performance characteristics, (2) identification of plausible detection and extinguishment principles, (3) a preliminary study of promising equipment functions and configurations, (4) achieving hardware reliability from manufacturing design through systems integration to end use. Specific areas in which additional research would enhance the reliability of fire-protection systems are recommended. (Author)

PB 181 124 $3.50

Bureau of Yards and Docks, Washington, D. C.
JANITORIAL FORMULAS. Engineered Performance Standards, Public Works Maintenance. Oct 60, 203p. NAVDOCKS P-706-1.

DESCRIPTORS: *Buildings, *Cleaning, *Handbooks, Maintenance, Maintenance personnel.

PB 181 123 $6.00

Bureau of Yards and Docks, Washington, D. C.
JANITORIAL HANDBOOK. Engineered Performance Standards, Public Works Maintenance. Feb 61, 424p. NAVDOCKS P-706.

DESCRIPTORS: *Buildings, *Cleaning, *Handbooks, Maintenance, Maintenance personnel.

UCRL-6658(Rev.) $0.75

Lawrence Radiation Lab., U. of California, Livermore.
HAZARDS CONTROL. Quarterly rept. no. 6, July-Sep 61, on Contract W-7405-eng-48. Oct 61, 35p.

This report, UCRL-6658(Rev.) replaces UCRL-6658

MACHINERY, FABRICATION, AND ACCESSORY EQUIPMENT

PB 181 125-2 $4.00

Bureau of Yards and Docks, Washington, D. C. MACHINE SHOP MACHINE REPAIR HANDBOOK. Engineered Performance Standards, Public Works Maintenance. Rev. June 60, Feb 61 and Oct 61, 281p. NAVDOCKS P-707, supersedes pub. of Aug 57.

DESCRIPTORS: *Machine shop practice, *Machines, Maintenance, *Handbooks.

AD-267 866 $8.60

Vitro Labs., West Orange, N. J. CONTINUOUS ACCELERATION OF PLASMA GENERATED BY THE HIGH-INTENSITY ARC, by C. Sheer, J. A. Cooney and others. Rept. on Contract AF 49(638)329. 29 Sep 61, 92p. 16 refs. Technical rept. VL-2120-12-0; AFOSR 1517.

DESCRIPTORS: *Electric propulsion, Ion rockets, Plasma physics, Ion accelerators, *Magnetohydrodynamics, *Plasma jets, Production, Solids, Propellants, Vaporization, Electric arcs, Theory, Pressure, Specific impulse, Tests, Feasibility studies, Laboratory equipment, Nozzles, Magnetic pinch.

A plasma propulsion system concept is proposed featuring the vaporization of a solid plasma propellant in a high-intensity arc to generate a refractory vapor jet in the maximum field region of a magnetic nozzle. Acceleration of the vapor plasma jet occurs as a result of its interaction with a diverging magnetic field. This concept is considered both theoretically and experimentally. The theoretical work reviews the single particle case, and proposes a method for developing the more applicable continuum model. The method is carried forward to the point where numerical solutions require a moderate computer program for completion. The major effort is concerned with the design, construction and operation of an accelerator facility to prove the basic technique. The chief advantages ascribed to the system are: reliability of operation for long periods of time, elimination of the propellant storage and engine wear problems, and an excellent probability for superior performance in the intermediate mission category. (Author)

Manufacturing Equipment and Processes

PB 181 130 $6.00

Bureau of Yards and Docks, Washington, D. C. SHEETMETAL, STRUCTURAL IRON AND WELDING FORMULAS. Engineered Performance Standards, Public Works Maintenance. Rev. Apr 60, rev. Oct 61, 419p. NAVDOCKS P-713.1, supersedes pub. of Jan 58.

DESCRIPTORS: *Sheets, *Iron, Forging, Soldering, *Welding, *Handbooks.

PB 181 129-1 $3.50

Bureau of Yards and Docks, Washington, D. C. SHEETMETAL, STRUCTURAL IRON AND WELDING HANDBOOK. Engineered Performance Standards, Public Works Maintenance. Rev. Apr 61, rev. Oct 61, 249p. NAVDOCKS P-713.

DESCRIPTORS: *Sheets, *Iron, Processing, *Welding, *Handbooks.

Transport, Traction and Hoist Facilities

PB 181 131 $2.50

Bureau of Yards and Docks, Washington, D. C. RAILROAD TRACK MAINTENANCE HANDBOOK. Engineered Performance Standards, Public Works Maintenance. Rev. Jan 61, 115p. NAVDOCKS P-714, supersedes pubs. of Aug 58 and May 59, change 1.

DESCRIPTORS: *Railroad tracks, Maintenance, Handbooks.

PB 181 132 $2.50

Bureau of Yards and Docks, Washington, D. C. RAILROAD TRACK MAINTENANCE FORMULAS. Engineered Performance Standards, Public Works Maintenance. Rev. Jan 61, 116p. NAVDOCKS P-714.1, supersedes pubs. of Aug 58 and May 59.

DESCRIPTORS: *Railroad tracks, Maintenance, *Handbooks.

MATERIALS

PB 181 134 $6.00

Bureau of Yards and Docks, Washington, D. C. PAINT HANDBOOK. Engineered Performance Standards, Public Works Maintenance. Rev. Feb 61, 472p. NAVDOCKS P-710, supersedes pub. of July 57.

DESCRIPTORS: *Paints, *Handbooks.

AD-267 360 repriced $0.50

Nonmetallic Materials Lab., Wright Air Development Div., Wright-Patterson AFB, Ohio. ELEVATED TEMPERATURE BEHAVIOR OF FIBERS, by Stanley Schulman. Rept. for July-Oct 60, on Fibrous Materials for Decelerators and Structures. Aug 61, 19p. 4 refs. WADD Technical note 60-298.

DESCRIPTORS: Mechanical properties, Fatigue (Mechanics), Elasticity, High temperature research, *Synthetic fibers, Re-entry aerodynamics, Textiles.

A study was conducted to determine the mechanical behavior of fibers at high temperatures for varied periods of time. These fibers are candidate materials for

use in decelerators, and expandable and rigid structures for satellites or space vehicles. Besides the condition of extremes of temperature, these fibers will have to be capable of operation under shock, vibration, solar and cosmic radiation and related aerospace environments. These high temperature fibers were evaluated in filament form at temperatures ranging from 70°F (65% relative humidity) to 2000°F. Since fibers normally were of diameters as low as 0.0003 inches, special equipment and procedures were designed to obtain their basic properties. (Author)

PB 159 633 $8.10

Southwest Research Inst., San Antonio, Tex.
RESEARCH STUDY OF RAPID PHOTOPROCESSING DEVELOPERS. PHASE III, by Milton H. Dickerson. Final rept. on Contract AF 33(038)22966. Mar 54, 88p. 21 refs. WADC Technical rept. 54-26; AD-83 899.

DESCRIPTORS: *Aerial photographs, Processing, *Photographic chemicals, Chemicals, Tests.

Formulas for rapid photoprocessing developers for use with aerial reconnaissance black and white film materials have been found which produce full development with Eastman Kodak Aero super XX films Types 55 and 86 in sixty seconds development at temperatures from 68 to 90°F. The Type 86 (prehardened) film was found to give the best pattern of high resolving power over a wide range of exposures, with maximum values of 60 to 70 lines/mm being obtained at 90°F., and also gave the highest film speeds in the new developers; whereas Eastman D-19 gave the same film speeds for both Types 86 and 55. The highest film speeds in Type 86 were obtained with formulations of pyro-amidol (WADC Speed-510 at $\gamma = 0.97$ for sixty seconds at 90°F.), and phenidonehydroquinone (WADC speed = 388 at $\gamma = 0.95$ for sixty seconds at 90°F.). The best resolving power characteristics were obtained with the amidol formulation, which gave high resolving power over a very wide exposure range. Methods of developing new formulations are discussed, and the strong role of pH value in selection in developing agents is stressed; amidol is shown by this criteria to have unusual characteristics which allow optimizing the pH for other characteristics, such as gelatine distortion and graininess. (Author)

PB 159 716 $1.60

Stanford Research Inst., Menlo Park, Calif.
EFFECT OF RADIATION ON THE MECHANICAL PROPERTIES OF PLASTICS, by David L. Chamberlain, Jr., Vincent Salmon, and Robert L. Walrath. Quarterly progress rept. no. 8, 15 Aug-15 Nov 59, on Contract DA 04-200-ORD-698. 1 Dec 59, 19p. SRI Project no. SU-2296; AD-233 581.

DESCRIPTORS: Plastics, *Radiation damage, Radiation effects, Mechanical properties, Measurement, Elasticity; *Polymers, Vibration.

The details and philosophy of gathering useful and accurate data on the vibratory behavior of such solids as high polymers are examined. The internal changes in the polymers are to be described that are caused by external agents whose effect is felt on a molecular scale; measurements of the internal changes are desired which will portray the action of shear as closely as possible, thereby giving good correlation with molecular events. Interrelationships are given among the following elastic constants: E, Young's modulus; G, shear (rigidity) modulus; B, compressional (bulk) modulus; and σ, Poisson's ratio. An evaluation is made of the vibrating reed apparatus (VIRA) for measuring dynamic elastic modulus. An examination of the variation of the elastic constant with dimensions reveals that the length must be very accurately known, since it appears as a fourth power in the relation. Measurement of the thickness is difficult because of the means of sample preparation and mode of vibration of the reed. The thickness of the reed in the region near the clamp should have the greatest influence on the potential energy. (See also PB 153 008)

Ceramics and Refractories

GEMP-70 $0.75

General Electric Co., Cincinnati, Ohio.
HIGH TEMPERATURE MATERIALS. Progress rept. no. 70, 1 Oct-30 Nov 61, on Contract AT(40-1)-2847. 19 Jan 62. 25p.

GEMP-7A $1.75

General Electric Co., Cincinnati, Ohio
HIGH-TEMPERATURE MATERIALS PROGRAM. Progress rept. no. 7, part A, on Contract AT(40-1)-2847. 15 Jan 62, 59p.

AD-267 247 repriced $1.00

Utah U., Salt Lake City.
SURFACE AND ENVIRONMENTAL EFFECTS ON CERAMIC MATERIALS, by P. Gibbs, G. S. Baker, and others. Rept. for June 60-May 61, on Ceramic and Cermet Materials, Contract AF 33(616)6832. July 61, 34p. 29 refs. ASD Technical rept. 61-182.

DESCRIPTORS: *Ceramic materials, *Cermets, Deformation, Creep, Diffusion, Corundum, Temperature, Thermal stresses, Impurities, Metals, *Solid state physics.

Polycrystalline sintered compacts of Alucer MC alumina doped with MgO or $Mg(CO_3)_2$ have been deformed in three point beam loading in the temperature range of 1000° to 1350°C. It is suggested that polycrystalline creep is controlled by diffusion of vacancies in the steady state. Creep behavior of Linde corundum 0.1 inch diameter rods in three point loading (1000°-1250°C) is described. At the lowest temperatures and stresses studied, measurable creep began after about an hour's time delay, and increased at an accelerating rate. A study is described of the dispersal of impurities from a metal contact over the free surface of corundum at 10^{-4} mm. Hg, by measuring the current flowing between two vacuum deposited Ag films as a function of time, temperature (20°-640°C), and applied field (0-12v.) It is suggested that detaching Ag

from the deposited film controls the rate of formation of a "semiconducting bridge" on or just beneath the corundum "free surface". (Author)

Y-1377 $0.50

Union Carbide Nuclear Co., Oak Ridge, Tenn.
A DISSOLUTION STUDY OF HIGH-FIRED BeO-UO_2 CERAMICS BY FUSION, by F. W. Postma, Jr. and R. E. Barringer. Rept. on Contract W-7405-eng-26. 26 Dec 61, 12p.

Fuels, Lubricants, and Hydraulic Fluids

PB 159 621 $2.60

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
FORCES PRODUCED BY FUEL OSCILLATIONS, by Jack Lorell. Progress rept. no. 20-149 on Contract DA 04-495-ORD-18. 16 Oct 51, 26p. 4 refs.

DESCRIPTORS: Airplane, *Fuel tanks, *Aviation fuels, Fuels, Oscillation, Frequency, Moments, Vibration, Mathematical analysis.

The present paper is concerned with the evaluation of the equivalent-pendulum analogy. For what range of parameters is the analogy useful? How much difference is there between the forces in the two cases? An attempt is made to answer these two questions for a rectangular tank and for a cylindrical tank. Furthermore, the actual forces on a tank due to small oscillations of the contained liquid are calculated. Formulas for the forces, moments, and force centers are derived. A number of tables and graphs are included in order to determine in a particular case whether the forces due to the liquid oscillations are important and, if so, whether the equivalent-pendulum analogy can be used to advantage.

PB 159 671-1 $8.10

Midwest Research Inst. [Kansas City, Mo.]
INVESTIGATION OF ANTI-ICING ADDITIVES IN JP-4 FUEL, by Daniel A. Netzel and Howard M. Gadberry. Rept. for 11 May-31 Dec 59, on Contract AF 33(616)6524. Jan 60, 86p. 24 refs. WADD Technical rept. 60-226, Part I; AD-248 668.

DESCRIPTORS: Chemical properties, Physical properties, Wetting agents, *Ice prevention, *Jet engine fuels, *Fuel additives, Fuels.

To prevent ice formation in JP-4 fuel, surfactants were evaluated as anti-icing additives. Qualitative (visual observations) and semiquantitative (flow rate determination) methods were used to screen surfactants. The better anionic and nonionic surfactants were further evaluated to determine their ability to solubilize water in JP-4 fuel containing excess water. Nucleating agents were also visually evaluated as an anti-icing additive for JP-4 fuel. The mechanism by which ice forms in JP-4 fuel, with and without additives, was elucidated by visual observations using a phase contrast microscope with a specially designed cold-stage attachment. The Karl Fischer electrical dead-stop end point titration method was used to determine the water content in JP-4 fuel with and without additives. The maximum transfer of additives from JP-4 fuel to water was determined by vapor phase chromatography, refractive index measurements and acid-base titrations. These studies were designed to supplement compatibility studies carried out by WADD. Many of the compounds tested were not developed or intended by the manufacturer for the conditions to which they have been subjected. Any failure or poor performance of a material is therefore not necessarily indicative of the utility of the material under less stringent conditions or for other applications. (Author)

PB 159 671-2 $9.10

Midwest Research Inst., Kansas City, Mo.
A STUDY OF JP-4 ADDITIVES: THEIR CHEMICAL CORRELATION AND PHYSICAL PARAMETERS AS EFFECTIVE ANTI-ICING AGENTS, by D. A. Netzel, R. L. Elliott, and G. F. Bechtle. Rept. for 1 Feb-31 Aug 60, on Investigation of Anti-Icing Additives in JP-4 Fuel, Contract AF 33(616)6524. Aug 60, 102p. 29 refs. WADD Technical rept. 60-226, Part II; AD-248 669.

DESCRIPTORS: *Ice prevention, *Fuel additives, *Jet engine fuels, Chemical properties, Physical properties, Fuels.

The physical properties and molecular structure of an additive in JP-4 jet fuel have been correlated with anti-icing effectiveness. Nearly 200 additives have been classified by their organic functional groups. Forty-nine additives, representing six of the eight classes of additives that have anti-icing characteristics, were selected for a detailed study of their anti-icing effectiveness. A method has been empirically derived to determine the anti-icing effectiveness of an additive. For those additives for which the anti-icing effectiveness is predicted good, an equation has been developed to estimate to within + or - 40 per cent the effective concentration necessary to prevent the formation of ice at -45 F in JP-4 fuel containing 2 cc excess H_2O/gal. A chemical and physical correlation study of the compatibility of the anti-icing additives for the Buna-N phenolic fuel tank topcoating was conducted. Procedures are given for determining (a) the solubility of water in surfactand-type additive-fuel systems, and (b) the surface and interfacial tension of additive-fuel systems. A method is described by which the freezing point of water in JP-4 fuel can be determined. (Author) (See also PB 159 671-1)

MATHEMATICS

BNL-702(T-243) $0.50

Brookhaven National Lab., Upton, N. Y.
A TABLE OF THE BRILLOUIN FUNCTION, by R. I. Schermer. Dec 61, 13p.

PB 159 341 $9.10

Case Inst. of Tech., Cleveland, Ohio.
DECISION RULES FOR MATHEMATICAL MODELS WITH IMPERFECTLY MEASURABLE PARAMETERS. [Rept. on Contract Nonr-1141(08)]. 19 Jan 61, 109p. 7 refs. AD-250 662.

DESCRIPTORS: *Statistical analysis, Errors, Probability, Costs, Programming, *Operations research, Calculus of variations.

This study is devoted to the derivation and evaluation of optimal decision functions for mathematical models wit imperfectly measurable parameters. The estimation problem is tied to a decision-making model. Two alternate approaches to a solution of the problem are given. The first uses the method of adjusting parameter estimates. The second casts the problem into calculus-of-variations forms. Calculation procedures are given and examples including Stanford Inventory Model are presented which illustrate the usefulness of taking consequence into account when estimates of parameters are used in decision models. (Author)

PB 159 379 $2.60

Institute of Mathematical Sciences, New York U., N. Y.
EXTREME VARIETIES, CONCAVE FUNCTIONS, AND THE FIXED CHARGE PROBLEM, by Warren M. Hirsch and Alan J. Hoffman (General Electric Co.) Rept. on Contract Nonr-285(38). Feb 61, 25p. 11 refs. IMM-NYU 277; AD-252 627.

DESCRIPTORS: *Convex sets, Conformal mapping, Topology.

An analysis is presented of various structural properties of convex sets and their application to the study of concave mappings. The investigation was prompted by a programming problem (the fixed charge problem) which involves the minimization of a concave function on a convex polyhedron. (Author)

PB 158 056 $1.60

Institute of Mathematical Sciences, New York U., N. Y.
MAXIMUM LIKELIHOOD CHARACTERIZATION OF DISTRIBUTIONS, by Henry Teicher. Rept. on Contract Nonr-285(38) and [Grant] NSF G-6331. Nov 60, 15p. 7 refs. IMM-NYU 278; AD-247 297.

DESCRIPTORS: *Statistical distributions, Sampling, Measure theory, Distribution.

PB 157 362 $3.60

Institute of Mathematical Sciences, New York U., N. Y.
ON THE FOUNDATIONS OF STATISTICAL INFERENCE. II, by Allan Birnbaum. Rept. on Contract Nonr-285(38). Oct 60, 38p. 3 refs. IMM-NYU 275; AD-246 905.

DESCRIPTORS: *Sequential analysis, Statistical distributions, Probability, Errors, Distribution.

Some previous technical developments are derived in more elementary fashion, under the restriction to statistical experiments with discrete sample spaces, but under the more general condition that any finite number of (simple) statistical hypotheses may be represented. For any such experiment, it is shown that: (1) for typical purposes of informative statistical inference, just the likelihood function on an observed outcome can and should be reported and interpreted to provide inferences of general interest concerning the statistical hypotheses (or unknown parameter values): and (2) for such purposes, the structure of the experiment from which an outcome was obtained is irrelevant, apart from determination of the likelihood function. Specific techniques for interpretation of likelihood functions are developed, particularly intrinsic confidence methods which constitute an appropriate generalization and refinement of confidence methods and conditional confidence methods. The relations of such methods to traditional methods, based on the principle of insufficient reason, are discussed as to form and interpretation. Analogous developments are given for experiments involving translation or scale parameters. (Author)

PB 159 376 $9.10

Michigan U. Coll. of Literature, Science, and the Arts, Ann Arbor.
SEQUENCE GENERATORS AND DIGITAL COMPUTERS, by A. W. Burks and J. B. Wright. Technical rept. on Proj. Michigan, Contracts Nonr-1224(21), DA 36-039-sc-52654, and DA 20-018-ORD-16971. Feb 61, 101p. 33 refs. 03105-19-T; AD-252 665.

DESCRIPTORS: *Digital computers, Coding, *Mathematical logic, Sequences, Computers.

Contents:
Introduction
  Sequence generators
  Special cases of sequence generators
  Reduced form algorithm
Sequence generators with one projection
  Definitions
  Subset sequence generator operation
  Decision procedure
Sequence generations with two projections
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  Time-shift theorem
Generalizations and applications
  Computation
  Formulas and sequence generators
  Sequence generators and conditions
  Sequence generators and regularity
  Infinite-sequence generators
  Probabilistic sequence generators.

MECHANICS

PB 157 815 $1.60

Institute of Engineering Research, U. of California, Berkeley.
ON VIBRATIONS OF PRETWISTED RECTANGULAR PLATES, by R. P. Nordgren. Technical rept. no. 12 on Contract Nonr-222(69). Oct 60, 14p. 6 refs. Series no. 131, issue no. 12; AD-246 564.

DESCRIPTORS: *Beams, *Metal plates, *Vibration, Theory, Mathematical analysis, Mechanics.

This paper contains an analysis of the free vibrations of uniformly pretwisted rectangular plates, utilizing the exact equations of classical shallow shell theory. Specifically, solutions are given (a) for two opposite edges simply supported and the other two free, and (b) for all four edges simply supported. Numerical results obtained for case (b) are compared with previous results for the torsional vibrations of pretwisted beams. A simple frequency equation is obtained for case (b), permitting a detailed study of the effects of both pretwist and longitudinal inertia. (Author)

PB 159 349 $2.60

Institute of Engineering Research, U. of California, Berkeley.
ON VIBRATIONS OF ELASTIC SPHERICAL SHELLS, by P. M. Naghdi and A. Kalnins. Technical rept. no. 13 on Contract Nonr-222(69). Jan 61, 30p. 13 refs. Series 131, issue 13; AD-251 800.

DESCRIPTORS: *Elastic shells, Vibration, Equations, Mathematical analysis, Theory, Deformation, Frequency, Spheres.

An investigation of axisymmetric and asymmetric vibrations of thin elastic spherical shells is described. With the limitation to torsionless axisymmetric motion, the basic equations for spherical shells of the classical bending theory of Love's first approximation are reduced to a system of two coupled differential equations in normal displacement of the middle surface and a stress function; this system of equations is applied to free vibrations of a hemispherical shell with a free edge and numerical results are obtained for the lowest natural frequency as a function of the thickness of the shell. A study of asymmetric vibrations of a hemispherical shell with a free edge according to the extensional theory is described. (Author)

PB 159 380 $2.60

Institute of Mathematical Sciences, New York U., N. Y.
EXTENSION OF A THICK INFINITE PLATE WITH A CIRCULAR HOLE, by Edward L. Reiss. Rept. on Contract Nonr-285(42). Feb 61, 28p. 14 refs. IMM-NYU 281; AD-253 054.

DESCRIPTORS: *Sheets, *Stresses, Series, Numerical methods and procedures, Analysis.

The method of Friedrichs (Reissner Anniv. Vol., pp. 197, Edwards, Ann Arbor, Mich. 1949; Proc. Sym. in Appl. Math. 3:117, McGraw Hill, New York, 1950) is extended to the stress concentration problem. Results are obtained in the form of a power series in epsilon. Only terms up to and including second order are given. Within this approximation it is shown that the plane stress theory yields extremely accurate, although non-conservative predictions of the maximum stress concentration for small but finite values of epsilon. This accuracy depends upon Poisson's ratio gamma. For example, with gamma equals 1/3, the error in the plane stress solution is less than 5% if epsilon is equal to or less than 3. For larger values of gamma and epsilon the error increases. More accurate approximations to the solution of the exact theory, which may be necessary for these values of epsilon, can be obtained by determining third and higher terms in the expansion. (Author)

PB 157 442 $3.60

Institute of Mathematical Sciences, New York U., N. Y.
A THEORY FOR THE SMALL DEFORMATIONS OF CYLINDRICAL SHELLS. PART II. A THEORY FOR THE SMALL UNSYMMETRIC DEFORMATIONS OF CYLINDRICAL SHELLS, by Edward L. Reiss. Rept. on Contract Nonr-285(42). Sep 60, 36p. 8 refs. IMM-NYU 274; AD-245 034.

DESCRIPTORS: *Elastic shells, Deformation, Elasticity, Theory, Stresses, *Differential equations, Series.

(See also PB 149 691)

Aerodynamics and Pneumatics

PB 159 388 $9.10

Aeroelastic and Structures Research Lab., Mass. Inst. of Tech., Cambridge.
SIMILARITY LAWS REQUIRED FOR EXPERIMENTAL AEROTHERMOELASTIC STUDIES. PART 2. HYPERSONIC SPEEDS, by John M. Calligeros and John Dugundji. Rept. on Contract Nonr-1841(46). Feb 61, 108p. 37 refs. Technical rept. 75-2; AD-253 970.

DESCRIPTORS: Aerodynamic configurations, *Aerodynamic heating, Mechanical properties, Aerodynamics, Ablation, *Hypersonics, Structures, *Airframes, Temperature, Elasticity, Thermal stresses.

The parameters associated with the external pressure and heat flux imposed on the structure, the heat transfer distribution within the structure (for both ablating and non-ablating materials) and the stress-deflection behavior under short-time and long-time loading conditions are considered. The structural parameters associated with nonlinear material properties at high temperatures, plasticity, creep and fatigue are treated. Similitude for the general aerothermoelastic problem is possible only for a scale ratio of one and for a thermal and pressure environment indentical with the prototype. The basic conflict arises when mutually satisfying the requirements of same temperature, Reynolds number, surface radiation parameter and the aeroelastic parameter. Means of dealing with this conflict are suggested. Available types of test facilities appropriate for these investigations are surveyed. (Author)

PB 158 864 $2.60

Aeroelastic and Structures Research Lab., Mass. Inst. of Tech., Cambridge.
SOME REMARKS ON THE THEORY OF NOISE GENERATION BY TURBULENT SHEAR-FLOWS, by Wiktor Eckhaus. Dec 60, 30p. 5 refs. ASRL Technical rept. 92-2; AD-250 697.

DESCRIPTORS: Fluid mechanics, Fluid flow, Gas flow, *Turbulent flow, Sound, Acoustics, *Jet acoustic oscillations, Theory, Mathematical analysis, *Noise, Jet mixing flow.

Contents:
The governing equation and its interpretation
On the structure of a turbulent jet-flow
Methods of solution
Short wavelengths approximation W. K. B. J. method
Method of approximation based on special functions
Expansion based on simplified models

AD-268 584 repriced $1.50

Flight Dynamics Lab., Aeronautical Systems Div., Wright-Patterson Air Force Base, Ohio.
COMPRESSIBLE BOUNDARY LAYER EQUATIONS AND STAGNATION POINT SOLUTION WITH DIFFERENCES IN THERMAL AND DYNAMIC BOUNDARY LAYER THICKNESSES BEING CONSIDERED, by Melving L. Buck. Rept. on Aerodynamics and Flight Mechanics. Aug 61, 54p. 29 refs. ASD Technical rept. 61-107.

DESCRIPTORS: *Laminar boundary layer, Boundary layer, *Compressible flow, Hypersonic flow, Thickness, Heat transfer, Friction, Aerodynamics, Mathematical analysis, Partial differential equations, Integral equations, Transformations (Mathematics).

This analysis is the groundwork for presenting boundary layer characteristics as functions of universal parameters. The usual assumption, that the thermal and dynamic boundary layer thicknesses have negligible effect on the boundary layer characteristics, is analyzed. Compressible laminar boundary layer equations with arbitrary pressure and temperature gradients are solved for stagnation point. The solution considers the difference in thermal and dynamic boundary layer thicknesses. Computations were carried out for stagnation point flow using this analysis. Conditions assumed were: $Pr = .75$, $\omega = .75$. Calculations covered a temperature ratio of $0 \leq \frac{T_w}{T_o} \leq 1$. The analysis shows that the difference in thermal and dynamic layers has an appreciable effect on the heat transfer parameter and a secondary effect on the skin friction parameter and the other characteristics of the boundary layer. The analysis indicates that the effect of the difference in the thermal and dynamic layers should be considered in any analysis of the boundary layer. (Author)

AD-267 973 $7.60

Institute of Aerophysics, U. of Toronto (Canada).
USE OF THE COANDA EFFECT FOR THE DEFLECTION OF JET SHEETS OVER SMOOTHLY CURVED SURFACES. PART II. SOME TESTS WITH SUPERSONIC, OVER AND UNDER EXPANDED JET SHEETS, by W. E. B. Roderick. Sep 61, 77p. 9 refs. UTIA Technical note no. 51.

DESCRIPTORS: Fluid flow, Gas flow, *Supersonic flow, *Jets, Deflection.

The turning of supersonic and underexpanded jet sheets by curved Coanda deflection surfaces was investigated experimentally. Three convergent - divergent nozzles with nominal throat dimensions of 1/16", 1/8" and 1/4" were used at pressure ratios from 1.4 to 2.8. The deflection surface was formed by the combination of an initial 1/4" wide flat plate followed by a quadrant of a circular cylinder of 4" radius. End plates were installed to ensure two-dimensional flow. The test results indicate that the turning of supersonic and under-expanded jet sheets by Coanda deflection surfaces can be accomplished as easily and efficiently as that of subsonic or over-choked jet sheets. Simple theory predicts a constant pressure coefficient for the flow over circular deflection surfaces, a result which is borne out by the experimental evidence. If a compressibility correction is applied to this theory, quantitative agreement between predicted and experimental pressure coefficients is fair. The discrepancy seems to be the result of viscous losses in the deflected flow. (Author)

Hydrodynamics, Hydraulics, and Hydrostatics

PB 159 638 $6.60

David Taylor Model Basin, Washington, D. C.
PROGRESS REPORT ON RESEARCH IN FRICTIONAL RESISTANCE. Sep 50, 65p. 39 refs. Rept. 726.

DESCRIPTORS: Surfaces, Sheets, Shear stresses, *Friction, Resistance, *Turbulent boundary layer, Bodies of revolution, Drag, Boundary layer, Water, Turbulence, Measurement, Ship models, *Hydrodynamics, Turbulent flow, Acoustics, Stimulation, Rods, Model basins.

Contents:
Note on studies of the resistance of hydraulically-rough surfaces, by Phillip Eisenberg
A review of the theory of the frictional resistance of a smooth flat plate with turbulent boundary layer, by L. Landweber
Effect of transverse curvature on frictional resistance by W. M. Ellsworth, Jr.
The boundary layer and drag of bodies of revolution by P. S. Granville
Recent progress in hot-wire measurement of turbulence in water, by M. S. Macovsky and W. L. Stracke
Model basin turbulence, by M. S. Macovsky and J. P. Breslin
Effects of turbulence stimulation on the boundary layer and resistance of a ship model as detected by hot wires, by J. P. Breslin and M. S. Macovsky
Experimentation to develop suitable methods for stimulating turbulent flow about ship models, by R. B. Couch and W. B. Hinterthan
A study of rods as stimulators of turbulence in boundary layers, by M. S. Macovsky and J. P. Breslin
On the acoustic stimulation of turbulence, by M. St. Denis

PB 159 579 $7.60

David Taylor Model Basin, Washington, D. C.
A THEORETICAL INVESTIGATION OF THE BODY PARAMETERS AFFECTING THE OPEN-LOOP PITCH RESPONSE OF A SUBMERGED TOWED BODY, by Samuel M. Y. Lum. Feb 60, 75p. 18 refs. Rept. 1369; AD-233 799.

DESCRIPTORS: *Towed bodies, Underwater objects, *Hydrodynamics, Stability, Pitch, *Dynamics, Mathematical analysis, Motion.

The pitching behavior of a submerged towed body is analyzed on the basis of the equations of motion. Restricting motion to the vertical plane of tow and following certain linearizing assumptions, the open-loop pitch response of the body is derived for a general input at the towpoint. The resulting analytical expression in the transform plane is then solved in the time domain for several simplified reference inputs. The steady-state pitch response is then examined with regard to minimizing pitch amplitude. It is shown that this process depends on certain parametric relations among the hydrodynamic stability derivatives, the equilibrium conditions of the towing-force vector, the mass loading conditions, the operating frequency, etc. Two specialized extremes to the general equilibrium condition in the first towing quadrant are given as examples and are discussed: first, the case of a heavy low-speed towed body with a very high lift-drag ratio; and secondly, the case of a light high-speed body with a very low lift-drag ratio. (Author)

METALLURGY

NYO-10008 $0.50

Aeroprojects Inc., West Chester, Pa.
ULTRASONIC TUBE DRAWING: NIOBIUM, ZIRCALOY-2, AND COPPER, by William B. Tarpley and Herbert Kartluke. Rept. on Contract AT(30-1)-1836. Dec 61, 25p. 19 refs.

USBM-U-887 $0.50

Albany Metallurgy Research Center, Oregon.
METALLURGICAL PROGRESS REPORT NO. 13, 1 Oct-31 Dec 61, on Contract AT(11-1)-599. 19p.

IS-316 $0.75

Ames Lab., Iowa State U. of Science and Tech.
THE LEAD-BISMUTH EUTECTIC, by Stanley J. Stachura and George Burnet. Rept. on Contract W-7405-eng-82. Dec 61, 31p. 65 refs.

AD-268 081 repriced $1.00

Defense Metals Information Center, Battelle Memorial Inst., Columbus, Ohio.
MACHINING OF SUPERALLOYS AND REFRACTORY METALS, by C. T. Olofson and F. W. Boulger. [Rept. on Contract AF 18(600)1375]. 27 Oct 61, 55p. 63 refs. DMIC memo. 134.

DESCRIPTORS: *Machining, *Heat resistant alloys, Mechanical properties, Iron alloys, Nickel alloys, Cobalt alloys, Chromium alloys, Molybdenum alloys, Tantalum alloys, Niobium alloys, Tungsten alloys, Welding, Cutting tools, Milling machines, Drilling machines, Tables, *Refractory materials.

Contents:
Machining superalloys
  General information
  Effect of alloy condition on machinability
  Minimizing welding tendencies of superalloys
  Minimizing work-hardening tendencies of superalloys
  Turning and facing operations
  Milling operations
  Drilling operations
Machining of refractory metals
  Tungsten
    Effect of surface contamination on machinability
  Molybdenum
    Effect of anisotropy, grain structure, and prior work on machinability
  Tantalum and columbium
Bibliography

AD-268 082 repriced $0.50

Defense Metals Information Center, Battelle Memorial Inst., Columbus, Ohio.
REVIEW OF RECENT DEVELOPMENTS IN THE TECHNOLOGY OF TUNGSTEN, by V. D. Barth. [Rept. on Contract AF 18(600)1375]. 24 Nov 61, 12p. 18 refs. DMIC memo. 139.

DESCRIPTORS: *Tungsten, Sheets, Extrusion, Annealing, Fibers, Metallurgy, Single crystals, Oxidation.

This memorandum briefly reviews a number of current developments of general interest in the technology of tungsten. Most of this information was received during the period Aug-Oct 61. Included in the discussion are: procedures for making W sheet; extrusion; annealing of W foils; fiber metallurgy; fabrication of W and W alloy single crystals; W alloys; and oxidation of W. (Author)

PB 159 667 $2.60

Illinois U., Urbana.
USE OF A RECRYSTALLIZATION METHOD TO STUDY THE NATURE OF DAMAGE IN FATIGUE OF METALS, by G. M. Sinclair and T. J. Dolan. Technical rept. no. 21 on Contract N6ori-71(04). Feb 51, 21p. 3 refs. ATI-97 893.

DESCRIPTORS: *Metals, *Fatigue (Mechanics), Tests, Crystallization, Test methods, Stresses, Fracture (Mechanics).

A study was made to evaluate the relative extent to which disruption of atomic bonds occurs during the early stages of a fatigue test. Periodical reheating to the recrystallization temperature was employed as a means of removing the effects of work hardening developed by the repeated stressing. Since this processing did not significantly effect the finite fatigue life, it is concluded that disruption of atomic bonds is initiated in local regions during a relatively early stage of cyclic stressing. (Author)

AD-261 006 $7.60

Martin Co., Baltimore, Md.
EVALUATION OF COATINGS FOR MOLYBDENUM, by Charles Wilks and Harry Magalotti. Final rept. 18 May 60-17 June 61, on Contract NOw 60-0321c. 15 June 61, 76p. Engineering rept. 11462-6.

DESCRIPTORS: *Molybdenum, *Coatings, *Refractory coatings, Refractory materials, Re-entry vehicles, *Heat resistant alloys, Aluminum alloys, Chromium alloys, Silicon alloys, Tests, Titanium alloys, Molybdenum alloys, Atmosphere entry, Simulation, Temperature, Failure (Mechanics), Diffusion, Tensile properties, Deformation, Oxidation, Effectiveness, Oxidation inhibitors.

Four oxidation-resistant coatings for molybdenum were evaluated for the effects of temperature, pressure and strain on coating life. Test conditions relevant to reentry vehicle environments were utilized so that performance data might be useful in establishing design criteria. Temperature is the dominant factor influencing time-to-coating failure. Pressure has no discernible effect on coating failure per se; it will affect the rate of oxidation of the exposed base material after coating failure. Strain levels below those which crack the coating have no measurable effect on coating performance. Strains sufficient to crack the coating completely produce immediate failure. All coatings, although brittle at room temperature, exhibit measurable ductility above 1600° F but tolerable levels, dependent on temperature, range from less than 0.5 to 8 to 10%. Strain tolerance below 1600° F was not evaluated. Diffusion is the basic controlling mechanism where excessive strain is avoided but may be accelerated at restricted local sites in the presence of incipient cracks, fissures and other coating defects so that the basic potential of the coating is seldom fully realized. (Author)

Y-1361 $1.00

Union Carbide Nuclear Co., Oak Ridge, Tenn.
PREPARATION AND HYDROGEN REDUCTION OF PURE, HIGH-SURFACE-AREA WO_3, by F. Lambdin, Jr. and J. E. Perry. Rept. on Contract W-7405-eng-26. 21 Feb 62, 45p. 20 refs.

Structural Metallurgy and Corrosion

PB 156 994 $2.60

Battelle Memorial Inst., Columbus, Ohio.
METALLURGICAL RESEARCH AND DEVELOPMENT IN ELECTRON DEVICES, by D. J. Maykuth, G. S. Root and others. Quarterly progress rept. no. 1, 15 Dec 58-14 Mar 59, Contract DA 36-039-sc-78253. [1959] 24p. 24 refs.

DESCRIPTORS: *Electron tubes, Materials, Niobium, Hafnium, *Hafnium compounds, *Niobium alloys, Wire, *Molybdenum, Nickel, Mechanical properties, Welding, Joints.

Suitable fabrication procedures have been developed for processing columbium and columbium alloys containing 0.65 per cent zirconium or 40 per cent tantalum to fine wire and thin strip. Experiments to develop a suitable fabrication procedure for processing hafnium and its alloys to similar wrought forms are in process. (See also PB 155 739)

ORNL-3171 $0.75

Oak Ridge National Lab., Tenn.
IN-PILE-AUTOCLAVE TEST OF ZIRCALOY-2 CORROSION IN $UO_2(NO_3)$ SOLUTION AND OF SOLUTION STABILITY, by R. J. Davis, G. H. Jenks and others. Rept. on Contract W-7405-eng-26. Feb 62, 24p.

NUCLEAR PHYSICS AND NUCLEAR CHEMISTRY

ANL-6459 $0.75

Argonne National Lab., Ill.
TRANSPORT SOLUTIONS TO THE ONE-DIMENSIONAL CRITICAL PROBLEM, by George J. Mitsis. Rept. on Contract W-31-109-eng-38. Dec 61, 36p. 8 refs.

TID-14377 $0.50

Atomic Energy Commission. Div. of Operational Safety, Washington, D. C.
FALLOUT FROM USSR 1961 NUCLEAR TESTS, by Gordon M. Dunning. Jan 62, 22p. 11 refs.

PB 159 353 $3.60

Institute of Engineering Research, U. of California, Berkeley.
THE ANGULAR DISTRIBUTION OF SPUTTERED POTASSIUM ATOMS, by R. P. Stein and F. C. Hurlbut. Rept. on Contract Nonr-222(45). 15 Jan 61, 34p. 23 refs. Technical rept. HE-150-170; Series no. 20, issue no. 129; AD-253 764.

DESCRIPTORS: *Potassium, *Ion bombardment, Rare gases, Distribution, Particles, Ion beams, Ion sources, Detection, Atoms.

The angular distributions of potassium particles issuing from a potassium surface under bombardment by noble gas ions were observed under moderately good vacuum conditions. Sputtered potassium atoms were detected for incident ion energies above approximately 15 ev and useful observations of angular distributions were obtained for incident ion energies in the range 50 to 450 ev for all available values of the incident angle. A means was discovered for the discrimination between the total sputtered flux and that fraction of it possessing particle energies above a certain threshold. The apparatus and experimental procedures are described and the observed distribution patterns and the two collision sputtering mechanism is discussed, along with related observations. (Author)

UCRL-9882 $2.00

Lawrence Radiation Lab., U. of California, Berkeley
ATOMIC BEAM STUDIES: HYPERFINE-STRUCTURE SEPARATIONS IN POTASSIUM-42, RUBIDIUM-84, AND CESIUM-129; MAGNETIC MOMENT AND HYPERFINE-STRUCTURE ANOMALY IN POTASSIUM-42, by Jhan M. Khan. Doctoral Thesis. Rept. on Contract W-7405-eng-48. 6 Oct 61, 92p. 46 refs.

UCRL-6320 $1.50

Lawrence Radiation Lab., U. of California, Livermore.
PRECISION MEASUREMENT OF THE NEUTRON-PROTON COHERENT SCATTERING AMPLITUDE, by W. C. Dickinson, L. Passell and others. Rept. on Contract W-7405-eng-48. 11 Sep 61, 63p. 28 refs.

MND-P-2581-I $4.00

Martin Co., Baltimore, Md.
ISOTOPIC POWER SOURCES. A COMPENDIUM, comp. by E. H. Smith. Property and processes review. Rept. on Contract AT(30-3)-217. June 61, 336p.

MND-P-2581-III $4.50

Martin Co., Baltimore, Md.
ISOTOPIC POWER SOURCES. A COMPENDIUM, comp. by E. H. Smith. Property and processes review part II. Rept. on Contract AT(30-3)-217. June 61, 366p.

ORNL-3205 $1.50

Oak Ridge National Lab., Tenn.
NUMERICAL ANALYSIS OF NEUTRON RESONANCES, by Susie E. Atta and John A. Harvey. Rept. on Contract W-7405-eng-26. Feb 62, 59p.

ORNL-3207 $4.50

Oak Ridge National Lab., Tenn.
TABLE OF ELECTRONIC RADIAL FUNCTIONS AT THE NUCLEAR SURFACE AND TANGENTS OF PHASE SHIFTS, by C. P. Bhalla and M. E. Rose. Rept. on Contract W-7405-eng-26. Feb 62, 389p.

Elementary Particles

PB 157 337 $1.10

High-Energy Physics Lab., Stanford U., Calif.
ELECTRON SCATTERING FROM THE PROTON, by F. Bumiller, M. Croissiaux, and R. Hofstadter. Rept. on [Contract N6onr-251(16)] [1960] 10p. 4 refs. HEPL-214.

DESCRIPTORS: *Protons, *Electrons, Scattering, *Magnetic spectrometers, Tests

A new large double-focusing magnetic spectrometer capable of analyzing electrons or other singly-charged particles was employed in electron-scattering work on the proton between incident electron energies of 650 Mev and 900 Mev and between scattering angles of 45° and 145°.

PB 157 518 $5.60

[High-Energy Physics Lab.] Stanford U., Calif.
PRINCIPAL METHODS OF MEASURING NUCLEAR SIZE, by Robert Hofstedter. Rept. on [Contract N6onr-251(16)] [1960] 55p. 105 refs. HEPL-209.

DESCRIPTORS: Alpha particles, *Particles, *Nuclei, Electrons, Antiprotons, Scattering, Proton scattering, Neutron scattering, Diffraction, Hyperfine structure, X-rays, Density, Magnetic moments, Sizing.

This report presents the essential ideas of the various methods of measuring nuclear sizes and a very brief accounting of some of the results in order to indicate the type of accuracy that can be obtained.

PB 158 113 $1.60

High-Energy Physics Labs., Stanford U., Calif.
REMARKS ON THE USE OF A SOLENOIDAL IRON-FREE SPECTROMETER IN HIGH-ENERGY ELECTRON PHYSICS, by R. Hofstadter, G. R. Burleson and others. Rept. on [Contract N6onr-251(16)] [1960] 17p. 7 refs. HEPL-222.

DESCRIPTORS: Solenoids, *Magnetic spectrometers, Design, Tests, Electrons, Scattering, Protons, Neutron, Deuterons, nuclear reactions, Particles.

An iron-free solenoidal type of spectrometer is described for use in high-energy electron physics. The spectrometer is of the ellipsoidal du Mond type and focuses 500 Mev/c momentum particles in a ring focus. The field employed is 20,000 gauss. A description of the instrument and its mounting in an experimental area is presented. A discussion is given of a series of experiments that can be carried out with this instrument. (Author)

PB 157 338 $1.10

High-Energy Physics Lab., Stanford U., Calif.
SPLITTING OF THE PROTON FORM FACTORS AND DIFFRACTION IN THE PROTON, by R. Hofstadter, F. Bumiller and M. Croissiaux. Rept. on [Contract N6onr-251(16)] [1960] 9p. 6 refs. HEPL-215.

DESCRIPTORS: *Protons, Diffraction, Electrons, Scattering, Nuclear reactions, *Proton scattering, Proton cross sections.

In electron-scattering studies of the proton the two proton form factors are separated.

PB 158 112 $2.60

High-Energy Physics Labs., Stanford U., Calif.
A TWO-SPECTROMETER SYSTEM FOR HIGH-ENERGY ELECTRON SCATTERING STUDIES, by R. Hofstadter, F. Bumiller and others. Rept. on [Contract N60nr-251(16)] [1960] 24p. 6 refs. HEPL-221.

DESCRIPTORS: *Magnetic spectrometers, Design, *Electrons, Scattering.

A description of a two-spectrometer system for electron scattering is given. The system consists basically of a large magnetic analyzer and a smaller magnetic analyzer, both arranged to move around the circumference of a circle surrounding a scattering target. Details of construction of the large spectrometer are given and the performance of the entire system is described. (Author)

Instruments and Installations

ORNL-3169 $1.25

Oak Ridge National Lab., Tenn.
CALCULATION OF THE PULSE-HEIGHT RESPONSE OF NaI(Tl) SCINTILLATION COUNTERS, by C. D. Zerby and H. S. Moran. Rept. on Contract W-7405-eng-26. Feb 62, 49p. 12 refs.

CEX-62.01 $0.50

Oak Ridge National Lab., Tenn.
TECHNICAL CONCEPT-OPERATION BREN, by J. A. Auxier, F. W. Sanders and others. Jan 62, 20p.

IDO-16688 $1.50

Phillips Petroleum Co., Idaho Falls.
A 4096 CHANNEL TWO-DIMENSIONAL ANALYZER FOR THE MTR VELOCITY SELECTOR, by F. L. Petree. Rept. on Contract AT(10-1)-205. 22 Dec 61, 64p. 5 refs.

DP-373 $0.50

Savannah River Lab., Aiken, S. C.
NEUTRON BLACKNESS TESTER FOR USE UNDER WATER, by John D. Anthony. Rept. on Contract AT(07-2)-1. Dec 61, 10p.

Nuclear Engineering and Power

APAE-107 $2.00

Alco Products, Inc., Schenectady, N. Y.
EFFECT OF RADIATION DAMAGE ON SM-1, SM-1A AND PM-2A REACTOR VESSELS, by D. W. McLaughlin, B. J. Rowekamp and others. Rept. on Contract AT(30-1)-2639. 14 Oct 61, 87p. 20 refs.

APAE-81 $2.50

Alco Products, Inc., Schenectady, N. Y.
RESEARCH AND DEVELOPMENT REPORTS FOR SODIUM TO SODIUM INTERMEDIATE HEAT EXCHANGER AND SODIUM TO WATER STEAM GENERATOR. Rept. on Contract AT(11-1)-666. 30 Oct 60, 136p.

ACNP-6118 $1.25

Allis-Chalmers Manufacturing Co., Milwaukee, Wis.
PATHFINDER ATOMIC POWER PLANT SUPERHEATER TEMPERATURE EVALUATION ROUTINE. AN IBM-704 COMPUTER PROGRAM, by William B. Ross. Rept. on Contract AT(11-1)-589. 31 Oct 61, 49p.

ANL-6378 $2.50

Argonne National Lab., Ill.
CRITICAL EXPERIMENTS WITH THORIA-URANIA FUEL IN HEAVY WATER, by W. C. Redman, S. G. Kaufmann and others. Rept. on Contract W-31-109-eng-38. Dec 61, 126p. 24 refs.

ANL-6457 $0.50

Argonne National Lab., Ill.
FACILITY FOR PHOTOGRAPHING IN-PILE MELTDOWN EXPERIMENTS IN TREAT, by G. H. Golden, C. E. Dickerman, and L. E. Robinson. Rept. on Contract W-31-109-eng-38. Jan 62, 23p. 11 refs.

ANL-6487 $0.50

Argonne National Lab., Ill.
THE THEORY AND MEASUREMENT OF CRITICALITY, by Charles N. Kelber. Rept. on Contract W-31-109-eng-38. Jan 62, 24p. 6 refs.

TID-3561(Rev. 1) $0.75

Atomic Energy Commission. Div. of Technical Information Extension, Oak Ridge, Tenn.
DIRECT ENERGY CONVERSION DEVICES, comp. by Henry D. Raleigh. A literature search. Dec 61, 34p. 344 refs.

NAA-SR-5416 $1.50

Atomics International, Canoga Park, Calif.
KINETIC EXPERIMENTS ON WATER BOILERS - "A" CORE REPORT - PART II, ANALYSIS OF RESULTS, comp. by M. Dunefeld. Rept. on Contract AT(11-1)-GEN-8. 1 Feb 62, 65p. 17 refs.

NAA-SR-6404 $0.50

Atomics International, Canoga Park, Calif.
RADIATION EFFECTS ON MODERATOR GRAPHITE IN THE SRE, by J. J. Gill and R. E. Taylor. Rept. on Contract AT(11-1)-GEN-8. 15 Jan 62, 25p. 8 refs.

BMI-1549(Del.) $2.00

Battelle Memorial Inst., Columbus, Ohio.
PROGRESS RELATING TO CIVILIAN APPLICATION DURING OCTOBER, 1961, by Russell W. Dayton and Clyde R. Tipton, Jr. Rept. on Contract W-7405-eng-92. 1 Nov 61, 82p.

WAPD-251 $1.25

Bettis Atomic Power Lab., Pittsburgh, Pa.
IRON, CARBON, AND NITROGEN IMPURITIES IN PWR-2 SEED FUEL, by J. Belle, L. Berrin and others. Report on Contract AT(11-1)-GEN-14. Dec 61, 48p. 4 refs.

WAPD-MRP-95 $2.50

Bettis Atomic Power Lab., Pittsburgh, Pa.
PRESSURIZED WATER REACTOR (PWR) PROJECT. Technical progress rept. 24 Oct-23 Dec 61, on Contract AT(11-1)-GEN-14. 125p.

WAPD-PWR-1606(Rev.) $4.00

Bettis Atomic Power Lab., Pittsburgh, Pa.
THE SHIPPINGPORT PRESSURIZED WATER REACTOR PROJECT CATALOG OF DOCUMENT ABSTRACTS. Rept. on Contract AT(11-1)-GEN-14. Dec 61, 324p.

WAPD-TM-228 $1.75

Bettis Atomic Power Lab., Pittsburgh, Pa.
ZIP-2: A ONE-DIMENSIONAL FEW-GROUP SYNTHESIS NUCLEAR REACTOR DEPLETION PROGRAM FOR THE PHILCO-2000 COMPUTER, C. J. Pfeifer and F. R. Urbanus. Rept. on Contract AT(11-1)-GEN-14. Nov 61, 73p. 5 refs.

TID-7617 $1.75

Chicago Operations Office, Atomic Energy Commission, Argonne, Ill.
NUCLEAR SUPERHEAT MEETING NO. 4, APRIL 13 AND 14, 1961, IDAHO FALLS, IDAHO, by Andrew E. Mravca and Daniel E. Simpson. 28 Apr 61, 69p. 70 refs.

DP-685 $0.75

du Pont de Nemours, E. I., and Co., Wilmington, Del.
HEAVY WATER MODERATED POWER REACTORS, comp. by R. R. Hood and L. Isakoff. Progress rept. Nov 61, on Contract AT(07-2)-1. Dec 61, 30p. 17 refs.

GA-2289 $2.25

General Atomic Div., General Dynamics Corp., San Diego, Calif.
THE DEVELOPMENT AND EVALUATION OF GRAPHITE-MATRIX FUEL COMPACTS FOR THE HTGR, by Walter V. Goeddel. Rept. on Contract AT(04-3)-314. 8 Aug 61, 103p. 18 refs.

GA-1954 $2.75

General Atomic Div., General Dynamics Corp., San Diego, Calif.
MARITIME GAS-COOLED REACTOR PROGRAM. Quarterly progress rept. for period ending 31 Dec 60, on Contract AT(04-3)-187. 158p.

GEAP-3538 $3.00

General Electric Co., San Jose, Calif.
NUCLEAR SUPERHEAT PROJECT. Quarterly progress rept. no. 4, Apr-June 60, on Contract AT(04-3)-189. Jan 62, 244p.

GEAP-3778 $1.25

General Electric Co., San Jose, Calif.
A SIMULATED SUPERHEAT REACTOR CORROSION FACILITY, by M. D. Fitzimmons, W. L. Pearl, and M. Siegler. Rept. on Contract AT(04-3)-189. 14 Aug 61, 45p. 8 refs.

GNEC-155 $1.75

General Nuclear Engineering Corp., Dunedin, Fla.
TAPE DRIVE AND RADIAL DRIVE CONTROL SYSTEMS. Rept. on Contract AT(11-1)-795. 27 Feb 61, 83p.

GNEC-156 $0.75

General Nuclear Engineering Corp., Dunedin, Fla.
WATER INJECTION TEST SIMULATING MODERATOR FLOODING OF BONUS SUPERHEATER ASSEMBLY. Rept. on Contract AT(11-1)-795. 15 Feb 61, 36p.

HW-65465 $0.75

Hanford Atomic Products Operation, Richland, Wash.
HYDRIDING IN PURPOSELY DEFECTED, ZIRCALOY-CLAD FUEL RODS, by M. K. Millhollen, G. R. Horn, and J. L. Bates. Rept. on Contract AT(45-1)-1350. Aug 61, 31p.

HW-69525 $2.25

Hanford Atomic Products Operation, Richland, Wash.
MATERIAL BUCKLING MEASUREMENTS ON GRAPHITE-URANIUM SYSTEMS AT HANFORD: A SUMMARY TABULATION, by D. E. Wood. Rept. on Contract AT(45-1)-1350. May 61, 95p. 11 refs.

HW-69393 $0.50

Hanford Atomic Products Operation, Richland, Wash.
SWELLING IN URANIUM: A COMPARISON OF THE EFFECTS OF IRRADIATION AND POSTIRRADIATION ANNEALING, by T. K. Bierlein, R. D. Leggett and others. Rept. on Contract AT(45-1)-1350. Apr 61, 14p. 7 refs.

MCW-1452 $0.75

Mallinckrodt Chemical Works, Weldon Spring, Mo.
METHODS OF SHORTENING THE HEATING CYCLE OF MAGNESIUM THERMITE BOMB REACTORS, by R. F. Leifield, R. O. Sandberg, and S. W. Weidman. Topical rept. on Contract W-14-108-eng-8. 13 Jan 62, 30p. 15 refs.

NYO-9658 $2.25

Massachusetts Inst. of Tech., Cambridge
HEAVY WATER LATTICE PROJECT, ed. by T. J. Thompson, Irving Kaplan, and A. E. Profio. Annual rept. on Contract AT(30-1)-2344. 30 Sep 61, 105p. 33 refs.

NYO-2695 $0.50

Nuclear Fuel Research Lab., United Nuclear Corp., New Haven, Conn.
NUCLEAR FUEL RESEARCH FUEL CYCLE DEVELOPMENT PROGRAM. Quarterly progress rept. 1 July-30 Sep 61, on Contract AT(30-1)-2374. 22 Nov 61, 22p.

NMI-1245 $1.25

Nuclear Metals, Inc., Concord, Mass.
HOT EXTRUSION OF UO_2 FUEL ELEMENTS, by J. G. Hunt, D. F. Kaufman, and P. Loewenstein. Final rept. 1 July 60-30 June 61, on Contract AT(30-1)-1565. 31 Oct 61, 49p. 4 refs.

ORNL-3221 $1.00

Oak Ridge National Lab., Tenn.
FEASIBILITY STUDIES - NONDESTRUCTIVE TESTING OF THE ENRICO FERMI REACTOR CORE B FUEL ELEMENT, by R. W. McClung. Rept. on Contract W-7405-eng-26. Feb 62, 43p.

ORNL-3215 $2.75

Oak Ridge National Lab., Tenn.
MOLTEN-SALT REACTOR PROGRAM. Progress rept. 1 Mar-31 Aug 61, on Contract W-7405-eng-26. Feb 62, 147p.

IDO-16733 $1.00

Phillips Petroleum Co., Idaho Falls.
MATERIALS TESTING REACTOR-ENGINEERING TEST REACTOR TECHNICAL BRANCHES. Quarterly rept. 1 July-30 Sep 61, on Contract AT(10-1)-205. 1 Dec 61, 44p. 33 refs.

PRWRA-GNEC-4 $1.00

Puerto Rico Water Resources Authority, San Juan and General Nuclear Engineering Corp., Dunedin, Fla.
BOILING NUCLEAR SUPERHEATER (BONUS) POWER STATION. SUPPLEMENTARY STUDY - EXTRAPOLATION TO LARGE CENTRAL STATION INTEGRAL NUCLEAR SUPERHEAT PLANT. Rept. on Contract AT(40-1)-2484 28 Jan 60, 36p.

DP-667 $0.50

Savannah River Lab., Aiken, S. C.
IRRADIATION OF A URANIUM METAL FUEL TUBE AT CHALK RIVER, by R. C. Pugh. Rept. on Contract AT(07-2)-1. Nov 61, 12p. 7 refs.

PHYSICS

PB 159 665 $5.60

Armour Research Foundation, Chicago, Ill.
INVESTIGATION OF SINGLE ENERGY GAP SOLAR CELL MATERIAL, by Robert J. Robinson. Final rept. 1 Sep 59-31 Aug 60, on Contract DA 36-039-sc-85247. 31 Aug 60, 57p. 3 refs. ARF 1155-15; ARPA Order no. 8059; AD-247 267.

DESCRIPTORS: *Photoelectric cells, *Solar energy, Materials, *Semiconductors, Cadmium alloys, Tellurides, Intermetallic compounds, Power supplies, Thermoelectricity, Cadmium compounds, Growth, Crystals, Single crystals.

Equipment was set up and utilized to grow CdTe by two different methods. The first method is a technique in which polycrystalline CdTe is sealed off in a quartz tube and passed through a gradient (or Stockbarger) furnace. Progress was made in growing dense, nearly single crystal ampoules with resistivities between 0.1 to 10 to the 6th power ohm cm depending upon indium dopant concentration. Better minority carrier lifetimes and greater uniformity from a semiconductor viewpoint are needed before the material is useable for fabricating solar cells. Solar cell fabrication studies on the currently available material (Stockbarger technique) were made in order to determine how CdTe behaves during the fabrication cycle. The lack of wide area photovoltaic response after fabrication and the tendency to pit during heat treatment indicated inhomogeneous material. Thermoelectric probe measurements showed that the material was inhomogeneous with interspersed n and p-type regions. (Author)

WAPD-TM-303 $0.75

Bettis Atomic Power Lab., Pittsburgh, Pa.
BOUND 1, 2, 3: IBM-704 PROGRAMS FOR THE ANALYTIC SOLUTION OF THE ONE ENERGY P_3 APPROXIMATION IN CYLINDRICAL GEOMETRY, by W. W. Clendenin and H. G. Gelbard. Rept. on Contract AT(11-1)-GEN-14. Nov 61, 31p.

WAPD-TM-277 $1.25

Bettis Atomic Power Lab., Pittsburgh, Pa.
SEAL-SHELL: A DIGITAL PROGRAM TO DETERMINE STRESSES AND DEFLECTIONS IN AN AXISYMMETRIC SHELL OF REVOLUTION, by C. M. Friedrich. Rept. on Contract AT(11-1)-GEN-14. Sep 61, 47p.

PB 159 664 $3.60

Eagle-Picher Research Labs., Miami, Okla.
INVESTIGATION OF INTEGRALLY COMPOSED VARIABLE ENERGY GAP PHOTOVOLTAIC SOLAR ENERGY CONVERTER, by L. E. Stone, J. E. Powderly, and W. E. Medcalf. Final technical summary rept. 1 Sep 59-31 Aug 60, on Contract DA 36-039-sc-85246. 10 Oct 60, 38p. 5 refs. ARPA Order no. 80-59; AD-247 039.

DESCRIPTORS: *Solar energy, *Photoelectric cells, Gallium compounds, Arsenides, Phosphides.

Techniques of fabrication of single gap gallium arsenide cells and variable-gap GaAs/Gap cells were established. Tentative comparison of cell parameters indicated superior performance of variable gap cells. Improvement in purity and single crystal structure of gallium arsenide and refinements in diffusion and fabrication techniques were made; these factors improved reproducibility in cell fabrication. A cell efficiency of 6.9% was achieved in one variable gap cell. An etching technique was developed as a tool for junction depth measurement and optimizing cell performance. A total of 86 variable-gap and 30 single-gap cells were made and evaluated. Statistical comparison of the best cells of each type indicated superior open circuit voltage, short circuit and conversion efficiency in the case of the variable gap cells. Improved reverse current diode characteristics were also observed in the variable gap cells. The final work period included: (1) studies of spectral response of cells; (2) studies of a higher order of gallium phosphide concentrations; and (3) decreasing initial depth of junctions while maintaining high carrier concentration. (Author)

UCRL-6649 $0.50

Lawrence Radiation Lab., U. of California, Livermore.
BACKWARD MONTE CARLO AND OTHER METHODS FOR "REVERSING" STOCHASTIC PROCESSES, by Edward L. Kaplan. Rept. on Contract W-7405-eng-48. 2 Oct 61, 20p.

UCRL-9871 $1.00

Lawrence Radiation Lab., U. of California, Berkeley.
FORTRAN PROGRAM HOUND: CALCULATING A GENERAL BEAM AVERAGE OR GEOMETRIC CORRECTION FOR SECONDARIES ESCAPING FROM A RECTANGULAR BUBBLE CHAMBER, by Alan Natapoff. Rept. on Contract W-7405-eng-48. 4 Oct 61, 45p.

UCRL-9944 $1.50

Lawrence Radiation Lab., U. of California, Berkeley,
MAGNETIC RESONANCE OF METALS AND PARAMAGNETIC IONS IN SOLUTION, by Judith Brown. Rept. on Contract W-7405-eng-48. 13 Dec 61, 73p. 40 refs.

UCRL-5956 $0.50

Lawrence Radiation Lab., U. of California, Livermore.
SOPHIST I: AN IBM 709/7090 CODE WHICH CALCULATES MULTIGROUP TRANSFER COEFFICIENTS FOR GASEOUS MODERATORS, by Eugene H. Canfield, Richard N. Stuart and others. Rept. on Contract W-7405-eng-48. 19 Oct 61, 24p.

LA-2625 $2.00

Los Alamos Scientific Lab., N. Mex.
PLASMA BROADENED LINES AND OSCILLATOR STRENGTHS OF CESIUM, by Philip M. Stone. Rept. on Contract W-7405-eng-36. Jan 62, 85p. 38 refs.

AD-267 633 $1.10

Michigan State U., East Lansing.
ON THE POSSIBILITY OF THERMOELECTRIC REFRIGERATION AT VERY LOW TEMPERATURES, by F. J. Blatt. Rept. on Contract AF 49(638)70. Nov 61, 10p. 13 refs. AFOSR 1703.

DESCRIPTORS: *Refrigerants, *Thermoelectricity, Refrigeration systems, Cooling, Thermal conductivity, Heat transfer, *Low temperature research, Transport properties, Metals, Semiconductors, Bismuth, Zinc.

In recent years much theoretical and experimental effort has been devoted to the development of materials suitable for direct conversion of heat to electrical energy (thermoelectric power generation) and for the inverse process, refrigeration by Peltier cooling. This report is concerned with the question of Peltier cooling, specifically the feasibility of using this technique at very low temperatures (4.2°K or less).

AD-268 888 repriced $1.00

Minnesota U., Minneapolis.
MEASUREMENT OF DISPLACEMENTS IN CONTACT-STRESS EXPERIMENTS, by G. E. Bowie. Rept. 1 Jan 60-30 June 61, on Metallic Materials, Contract AF 33(616)6828 and National Science Foundation Grant G-11303. Oct 61, 39p. 10 refs. ASD Technical rept. 61-450.

DESCRIPTORS: Metals, *Spheres, Sliding contacts, Stresses, Loading, *Piezoelectric transducers, Transducers, *Interferometers, Design, Sound reproduction systems, Calibration, Instrumentation, Test equipment.

A major part of the instrumentation for contact-stress investigations being carried out at the University of Minnesota has the function of providing displacement measurements in the microinch range. This report describes a modified phonograph-type displacement pickup and an interferometer for calibrating it. In addition, there are described a piezoelectric driving transducer used to load spheres upon which experiments are performed, a capacitance-type displacement pickup, and modifications of an Instron testing machine upon which the apparatus is mounted. (Author)

MATT-Q-16 $1.00

Plasma Physics Lab., Princeton U., N. J.
QUARTERLY REPORT COVERING THE PERIOD, 1 JULY-30 SEPTEMBER 61, on Contract AT(30-1)-1238. 7 Nov 61, 34p.

SCR-456 $0.50

Sandia Corp., Albuquerque, N. Mex.
TEMPERATURE IN LENGTH MEASUREMENT, by K. G. Overbury. Feb 62, 13p.

Acoustics

AD-268 576 repriced $2.25

Boeing Co. [Seattle, Wash.]
THE USE OF ACOUSTIC SCALE MODELS FOR INVESTIGATING NEAR FIELD NOISE OF JET AND ROCKET ENGINES, by Walter V. Morgan, L. C. Sutherland, and Kenneth J. Young. Rept. on Dynamic Problems in Flight Vehicles, Contract AF 33(616)6834. Apr 61, 99p. 47 refs. WADD Technical rept. 61-178.

DESCRIPTORS: *Jet engine noise, *Rocket motor noise, Noise generators, Noise, Propagation, Measurement, Test facilities, Test equipment, Model tests, Acoustics.

Analytical and experimental studies have been made to examine the feasibility of using acoustic scale models for near field noise investigations. Analyses show that the important characteristics of noise generation, propagation, and measurement can be scaled. A relatively few deviations from this involve small errors which are generally negligible in the near fields. The most straightforward model is seen to be one which duplicates the gas flow parameters of the full scale engine. The validity of such models has been demonstrated by a series of tests for a wide variety of nozzle exit conditions, from turbojet through rocket exhausts, and whether in a free field or in the presence of objects which interfere with the flow, such as shaped nozzles and flame deflectors. It is further determined both analytically and experimentally that models, in certain cases, may be simplified without impairing the results of a scaled test. (Author)

PB 159 672 $4.60

Cambridge Acoustical Associates, Mass.
SOUND RADIATION FROM A CYLINDRICAL SHELL EXCITED BY CONCENTRATED FORCES, by Preston W. Smith, Jr. Technical rept. on Contract Nonr-2739(00). 26 June 59, 41p. 15 refs. AD-232 758.

DESCRIPTORS: Cylindrical bodies, Vibration, *Sound, Pressure, Matrix algebra, Structural shells, Fluid mechanics, *Dynamics, Impedance.

An approximate method is summarized for analyzing the vibration and ensuing sound radiation of a finite cylindrical shell excited by concentrated forces. The input forces act on a foundation structure which transmits the vibration to certain points or small areas on the shell. The dynamical reactions of fluid, shell, and foundation are represented by mechanical impedances. Fluid and shell reactions are represented by a truncated series of modal impedances. The elements of the foundation are taken as simple lumped-constant structures. A formal solution for the responsive motion of the shell is derived in matrix form, appropriate to machine calculation. A matrix equation for the input impedance at the driving point is also derived. The interaction of shell and foundation is incorporated in these expressions by means of a connection matrix, whose elements are constant and describe the geometry of the attachment of the foundation to the shell. A solution for the radiated pressure and radiation patterns is also outlined. (Author)

Electricity and Magnetism

AD-267 112 $4.60

Carnegie Inst. of Tech., Pittsburgh, Pa.
THE HALL EFFECT IN FERROMAGNETICS, by Emerson M. Pugh. Final rept. on Contract AF 49(638)257. 30 June 61, 43p. 50 refs. AFOSR-1175.

DESCRIPTORS: *Ferromagnetism, *Ferromagnetic materials, Hall effect, Resistance, Measurement, Electrons, Low temperature research, Nickel alloys, Palladium alloys, Manganese alloys, Iron alloys, Cobalt alloys, Silver alloys, Zinc alloys, Copper alloys, Processing, Melting, Metals, Aluminum compounds, Oxides, Crucibles, Controlled atmospheres, Alloys, Quantum mechanics, Conductivity.

Included in the report is:
Hall effect and resistivity of Ni-Pd alloys, pub. in The Physical Review 120:1218-1223, 15 Nov 60

Results of Hall effect and resistivity measurements on a number of ferromagnetic metals and alloys are presented. These measurements verify some earlier ideas regarding the electronic structure in the region of nickel and its alloys and give new information about this structure in the region of iron. It is shown that the four band model of the ordinary Hall effect in ferromagnetics correctly predicts the results and yields new information regarding the band structure. The measurements of the extraordinary Hall effect are compared with predictions of recent theories. It is found that in their present form none of these theories adequately describe the data. Data are also given for α phase silver-zinc alloys. (Author)

AD-267 791 repriced $1.50

Laboratories for Research and Development, Franklin Inst., Philadelphia, Pa.
INVESTIGATION OF THE STRUCTURAL AND MAGNETIC PROPERTIES OF THIN FERROMAGNETIC FILMS, by W. D. Doyle, J. Johnson and others. Rept. for May 59-July 60 on Applied Research in Electrical, Electronic and Magnetic Materials, Contract AF 33(616)6298. July 60, 58p. 23 refs. WADD Technical rept. 60-787.

DESCRIPTORS: *Ferromagnetic materials, *Thin films, Magnetic properties, Instrumentation, Preparation, Electron microscopy, Electron diffraction analysis, Vacuum systems, Structures, Mathematical analysis, Torque, Hysteresis

The principle object of the research is the correlation of the magnetic and structural properties of thin ferromagnetic films. This report, which describes in detail the instrumentation, the film preparation and the first results obtained with 77:23 permalloy films, covers the first phase of the work. The structural investigation was carried out by using electron microscopy and electron diffraction techniques. Replicas of the surface of the films indicated the presence of a roughness which, at present however, has not been correlated to the magnetic uniaxial anisotropy of the films. The magnetic experiments included the recording of hysteresis loops with an ac hysteresigraph, the observation of domain patterns in a Kerr Magneto-Optic apparatus and the measurement of the angular dependence of the torque with a sensitive torque magnetometer. The magnetic data are discussed in terms of the behavior of single domain and multi domain magnetic particles. (Author)

MURA-633 $0.50

Midwestern Universities Research Association, Madison, Wis.
SOME REMARKS ON FORCE-FREE COILS, by J. Van Bladel. Rept. on Contract AT(11-1)-384. 8 Dec 61, 23p.

Solid State Physics

ORNL-3213 $2.75

Oak Ridge National Lab., Tenn.
SOLID STATE DIVISION ANNUAL PROGRESS REPORT, for period ending 31 Aug 61, on Contract W-7405-eng-26. 162p.

PB 156 554 $8.60

X-Ray and Crystal Analysis Lab., Pennsylvania State U., University Park.
CRYSTAL STRUCTURE RESEARCH BY X-RAY AND NEUTRON DIFFRACTION, by Ray Pepinsky. Quarterly progress rept. no. 1, 15 June-31 Aug 54, on Contract DA 36-039-sc-63233. [1954] 100p. 16 refs.

DESCRIPTORS: Sodium, Potassium, Tartrates, Lead compounds, Titanates, Zirconates, Sodium compounds, Niobates, Cadmium compounds, Ammonium radicals, Hydrogen, Phosphates, Salts, *Ferroelectric crystals, Crystals, *Ferroelectricity, *Antiferroelectricity, Dielectrics, *Crystal structure, *X-ray diffraction analysis, *Neutron diffraction analysis, Optical analysis.

The aims of the present program are: elucidation of crystal-structural principles responsible for piezoelectric, ferroelectric, high dielectric, optical and some semiconducting behavior of solids; development of understanding of structural mechanisms of ferroelectric and antiferroelectric transitions; prediction and discovery of new crystalline materials with possible applicability as electromechanical transducer materials, memory elements, and other properties of military value; and instrumental developments of significance to the above studies. Techniques employed include piezoelectric, dielectric, optical, X-ray and neutron diffraction measurements. (Author)

PB 156 555 $6.60

X-Ray and Crystal Analysis Lab., Pennsylvania State U. [University Park].
CRYSTAL STRUCTURE RESEARCH BY X-RAY AND NEUTRON DIFFRACTION, by Ray Pepinsky. Quarterly progress rept. no. 3, 1 Dec 54-28 Feb 55, on Contract DA 36-039-sc-63233. [1955] 67p. 19 refs.

DESCRIPTORS: Potassium, Sodium, Tartrates, Lead compounds, Titanates, Zirconates, Salts, *Ferroelectric crystals, *Antiferroelectricity, *Ferroelectricity, Crystals, *Crystal structure, *X-ray diffraction analysis, *Neutron diffraction analysis, Goniometers.

The structure of ferroelectric $PbTiO_3$ has been established by joint X-ray and neutron diffraction studies. This reveals very large shifts in Ti (0.29A) and Pb (0.47A) atoms from the cubic perovskite positions, with both these atoms moving in the same direction along the tetragonal lattice. The oxygen atoms remain unchanged in positions, except for the stretching of the cell by 6 percent in the tetragonal direction. Some preliminary results of a single-crystal neutron study of $PbTiO_3$ are reported as well. (Author)

PB 156 556 $3.60

X-Ray and Crystal Analysis Lab., Pennsylvania State U. [University Park].
CRYSTAL STRUCTURE RESEARCH BY X-RAY AND NEUTRON DIFFRACTION, by Ray Pepinsky. Quarterly progress rept. no. 4, p Mar-31 May 55, on Contract DA 36-039-sc-63233. [1955] 34p. 14 refs.

DESCRIPTORS: Barium compounds, Lead compounds, Titanates, Zirconates, Salts, *Ferroelectric crystals, Dielectrics, Crystals, Single crystals, *Crystal structure, *X-ray diffraction analysis, *Neutron diffraction analysis, Potassium, Sodium, Tartrates.

It has now been possible to establish the crystal structure of tetragonal ferroelectric $BaTiO_3$. The displacements, in Angstrom units, from the true perovskite positions are: The Ti atom moves along the tetragonal direction by 0.06 A; the oxygens directly above and below the Ti also move along the tetragonal direction, by -0.09 A; and the oxygens on the faces parallel to the tetragonal axis move in the same direction as the other oxygens, but by 0.06 A. Assuming ionic polarization only, and full charges on the ions, the spontaneous polarization in $BaTiO_3$, based on the above model, should be 17 microcoulombs per cm^2. Electronic polarization should

produce additional charge displacement. The observed polarization is 26 microcoulombs per cm^2. The results for $BaTiO_3$ are compared with those for $PbTiO_3$, and both are discussed with respect to the theories previously advanced for ferroelectricity in these structures. (Author) (See also PB 156 555)

PB 156 557 $17.50

X-Ray and Crystal Analysis Lab., Pennsylvania State U., University Park.
CRYSTAL STRUCTURE RESEARCH BY X-RAY AND NEUTRON DIFFRACTION, by Ray Pepinsky. Quarterly progress rept. no. 5, 1 June-31 Aug 55, on Contract DA 36-039-sc-63233. [1955] 272p. 169 refs.

DESCRIPTORS: Sodium, Potassium, Tartrates, Lead compound, Barium compounds, Titanates, Zirconates, Hydrogen, Phosphates, Guanidines, Aluminum, Sulfates, Hydrates, Niobates, Ammonium radicals, Dielectrics, *Ferroelectric crystals, Crystals, *Crystal structure, Growth, Thermodynamics, *Antiferroelectricity, *Ferroelectricity, *X-ray diffraction analysis, *Neutron diffraction analysis.

This report includes:
Some aspects of ferroelectricity, by Gen Shirane, Franco Jona, and Ray Pepinsky
Crystal structure analyses of piezoelectric, ferroelectric, high dielectric and semiconducting crystals by x-ray and neutron diffraction, with the purpose of furthering knowledge of the crystal-structural principles responsible for the physical behavior of these crystals, development of understanding of the mechanisms of ferroelectric and antiferroelectric transitions, and discovery of new crystalline material of possible value for military applications. (See also PB 156 556)

PB 156 558 $3.60

X-Ray and Crystal Analysis Lab., Pennsylvania State U., University Park.
CRYSTAL STRUCTURE RESEARCH BY X-RAY AND NEUTRON DIFFRACTION, by Ray Pepinsky. Quarterly progress rept. no. 6, 1 Sep-30 Nov 55, on Contract DA 36-039-sc-63233. [1955] 40p. 13 refs.

DESCRIPTORS: Sodium, Potassium, Tartrates, *Antiferroelectricity, Salts, Crystals, *Crystal structure, *X-ray diffraction analysis.

An x-ray analysis of the two (lower and upper) nonferroelectric phases of Rochelle Salt has been accomplished, preparatory to neutron analyses of these phases. An analysis has been carried through to determine the possibility of distinguishing by x-rays between displaced and anisotropically oscillating atoms in the ferroelectric phase. X-ray and neutron analyses of that phase continue. Methods for preparation of single crystals of $NaNbO_3$ are under examination. A single-crystal x-ray analysis of antiferroelectric $PbZrO_3$ is in progress, aided by a neutron powder diffraction study. X-ray powder diffraction studies of $KTaO_3$ are in progress at 5°K. (Author) (See also PB 156 557)

PB 156 559 $8.10

X-Ray and Crystal Analysis Lab., Pennsylvania State U., University Park.
CRYSTAL STRUCTURE RESEARCH BY X-RAY AND NEUTRON DIFFRACTION, by Ray Pepinsky. Quarterly progress rept. no. 7, 1 Dec 55-29 Feb 56, on Contract DA 36-039-sc-63233. [1960] 89p. 15 refs.

DESCRIPTORS: Potassium, Sodium, Tartrates, Alums, Dielectrics, Salts, *Ferroelectricity, *Ferroelectric crystals, *Crystal structure, *X-ray diffraction analysis, Temperature, Microstructure, *X-ray diffraction cameras, Cameras, Goniometers, Design, Antiferroelectricity.

This report includes: (1) a brief report of a new, simple method for observing, under the polarized microscope, crystal transitions at low temperatures; (2) a report of the discovery of a new, very large family of ferroelectrics, the beta-alums —the discovery having been aided by the new low-temperature microscope stage; (3) a table of x-ray structure factors from the x-ray study of the two non-ferroelectric phases of Rochelle Salt; (4) a report on the successful completion and application of our new Weissenberg x-ray goniometer for studies near liquid helium temperature, and the application of the camera to the study of $KTaO_3$ at 5°K, and to single-crystal studies of alpha-quartz at very low temperature. (Author) (See also PB 156 558)

PB 156 560 $4.60

X-Ray and Crystal Analysis Lab., Pennsylvania State U., University Park.
CRYSTAL STRUCTURE RESEARCH BY X-RAY AND NEUTRON DIFFRACTION, by Ray Pepinsky. Quarterly progress rept. no. 8, 1 Mar-31 May 56, on Contract DA 36-039-sc-63233. [1956] 47p. 3 refs.

DESCRIPTORS: Sodium, Potassium, Tartrates, Sodium compounds, Niobates, Guanidines, Aluminum, Sulfates, Hydrates, Salts, *Ferroelectric crystals, *Ferroelectricity, Hysteresis, Measurement, Crystals, *Crystal structure, *X-ray diffraction analysis, Temperature.

A new instrument has been developed for measurement of ferroelectric hysteresis and undistorted display of hysteresis loops, even in the presence of relatively high conductivity. Ferroelectric crystal structures are only slight distortions from generally higher symmetry structures in the higher-temperature phases. The structure analyses are best carried out in the non-ferroelectric phase, and then refined to the slightly-distorted ferroelectric phase. In the Rochelle Salt structure, it is difficult to determine whether some atoms are actually slightly displaced, or are oscillating strongly. The split atom approximation can be used, in place of anisotropically-oscillating atoms, in machine computations when the storage capacity of the machine is too small to permit introduction of anisotropic temperature factors. An x-ray structure study has been made of guanidinium aluminum sulfate hexahydrate. (Author) (See also PB 156 559)

PB 156 551 $8.60

X-Ray and Crystal Analysis Lab., Pennsylvania State U., University Park.
CRYSTAL STRUCTURE RESEARCH BY X-RAY AND NEUTRON DIFFRACTION, by Ray Pepinsky. Quarterly progress rept. no. 9, 1 June-31 Aug 56, on Contract DA 36-039-sc-63233. [1956] 96p. 16 refs.

DESCRIPTORS: Ammonium, Cadmium, Sulfates, Alums, Aluminum, Ammonium radicals, Methyl radicals, Chromium, Barium compounds, Titanates, Dielectrics, *Ferroelectricity, *Ferroelectric crystals, Crystals, *Crystal structure, *Neutron diffraction analysis.

A dielectric and thermal study of two of the newly-discovered ferroelectric alums, methylammonium aluminum alum and the chromium isomorph, is presented. A new ferroelectric, in the langbeinite system, is reported. This is $(NH_4)_2Cd_2(SO_4)_3$. A neutron analysis of the orthorhombic ferroelectric phase of $BaTiO_3$ is described. (Author) (See also PB 156 560)

Theoretical Physics

UCRL-6585 $0.75

Lawrence Radiation Lab., U. of California, Livermore
STABILITY OF CYLINDRICAL PLASMAS FOR AXIAL PERTURBATION WAVELENGTHS LESS THAN THE RADIAL THICKNESS OF THE EQUILIBRIUM PLASMA, by Alvin M. Saperstein. Rept. on Contract W-7405-eng-48. 7 Aug 61, 26p. 9 refs.

PB 159 619 $2.60

Republic Aviation Corp. [Farmingdale, N. Y.]
EXPANSION OF A PLASMA IN A UNIFORM FIELD, by M. Bernstein and L. N. Zadoff. Rept. on Contract AF 29(601)1218. 9 Nov 59, 29p. 6 refs. Rept. no. 206-957; AFSWC-TR-59-66; AD-159 619.

DESCRIPTORS: *Plasma physics, Magnetic fields, Mathematical analysis, Differential equations, Density, Energy, Pressure.

E. N. Parker's [Astrophys. J. 3, supply. 27:51-76, July 1957] treatment of the expansion of a homogeneous plasma in a uniform field results, in the case of spherically symmetrical initial conditions, in a set of two differential equations in three unknown functions. By use of the principle of conservation of energy, one may eliminate one unknown immediately. The resulting set of two simultaneous nonlinear differential equations may then be solved in principle. A solution will permit calculation of the geometrical configuration density, magnetic field intensity, internal energy, and pressure as functions of time, initial energy, and original magnetic field. For the stationary state, the derivatives disappear and an explicit analytic solution is obtained. This solution is independent of Parker's assumptions concerning homogeneity during the expansion. (Author)

PB 159 618 $2.60

Republic Aviation Corp. [Farmingdale, N. Y.]
SELF-CONFINEMENT OF PLASMAS, by L. N. Zadoff, M. Bernstein, and J. Reinheimer. Rept. on Contract AF 29(601)1218. 9 Oct 59, 26p. 5 refs. Rept. no. MSD 206-955; AFSWC-TR-59-64; AD-236 699.

DESCRIPTORS: *Plasma physics, Magnetic pinch, Magnetic fields, Electric currents, Mathematical analysis.

Instability of Plasmoids with No External Currents: An analysis demonstrates that an isolated plasmoid must expand. A plasmoid is defined as a plasma containing currents in the plasma or on its surface and hence associated with a magnetic field. Expansion is demonstrated by extending the integrations involved in the Chandrasekhar-Fermi virial theorem over all space. Virial Theorem Applied to a Linear Pinch: This theorem demonstrates that the general conclusion of the Chandrasekhar-Fermi virial theorem regarding the impossibility of self-confinement in a bounded, three-dimensional region of space does not contradict the description of the pinch effect. In the linear pinch, the radius of a plasma cylinder is bounded, but not its length. Nonconfinement of an Assembly of Charged Particles: Results show that if the particle description of plasma behavior is substituted for the continuous-fluid description, it can still be shown that self-confinement is possible only in less than three dimensions (Author)

Wave Propagation

PB 159 624 $9.10

Collins Radio Co., Cedar Rapids, Iowa.
ANTIFADING SCATTERING EQUIPMENT. Final development rept. on Contract AF 30(602)1691. Dec 59, 103p. 11 refs. Rept. no. CER-1075; RADC-TR-59-232; AD-232 916.

DESCRIPTORS: *Radio communication systems, Radio equipment, *Radio waves, Scattering, *Radio transmission, Signal to noise ratio, Attenuation, Reflection, Balloons, Ultra high frequency.

This experiment was performed to examine and study the mechanism of common-volume scattering in an over-the-horizon tropospheric radio scatter link. A mechanism of forward scattering has been postulated to explain the variation of transmission loss with distance beyond the horizon. With this method, the scattering cross-section of a macroscopic element of volume is assumed to vary as the mean square deviation of dielectric constant and inversely as the fourth power of the scattering angle. It is assumed that the received power is contributed sole by the scattering from the volume which is common to the two antenna beams. More recently, an alternate mechanism has been suggested to explain the same phenomenon. In this method, the received power is the result of the contributions in the commonly illuminated volume from layer or strata in the atmosphere of horizontal extent. It is presumed that reflection of the radio energy takes place from these layers which are at least large as compared with wavelength. (Author)

PB 157 388 $5.60

Electronics Research Lab., U. of California, Berkeley.
ELECTROMAGNETIC BACK SCATTERING FROM MULTIPLE SPHERES, by N. Kumagai and D. J. Angelakos. Rept. on Contract Nonr-222(74). 1 Sep 60, 51p. 19 refs. Rept. no. 116; Series no. 60, issue no. 313; AD-247 431.

DESCRIPTORS: *Electromagnetic wave reflections, Electromagnetic waves, Scattering, Diffraction, Electromagnetic fields, Electric fields, Spheres, Reflection, Refraction, Electron optics, *Antennas.

Expressions for the back-scattering cross section of multiple metallic spheres are obtained for plane-wave incidence, taking into account double reflections. The analysis shows that the double reflection contributions decrease and the back-scattering cross section tends to its average magnitude as the center spacing is increased. If the incident wave has a cylindrical phase front instead of a plane phase front, increasing the spacing creates an appreciable phase-error effect. This phase error effect is analyzed and numerically calculated for both uniform and non-uniform amplitude cases. The back-scattering cross section of two spheres tends (with semisoidal variations) to four times that of a single sphere as the spacing is increased. The back-scattering cross section of three spheres tends to be nine times that of a single sphere, with sinusoidal variations as the separation increases. The qualitative analysis of the back-scattering characteristics of end-illuminated arrays is based on the following assumptions: (1) independent scattering hypothesis, (2) geometrical-optics approximation, and (3) far-zone field assumption. (Author)

AD-267 659 $3.60

Naples U. (Italy).
SOME CONSIDERATIONS ON IONOSPHERIC SELFMODULATION AT OBLIQUE INCIDENCE, by M. Cutolo. Scientific rept. no. 3 on Contract AF 61(514)1299. Dec 60, 38p. 9 refs. AFCRL-408.

DESCRIPTORS: *Radio waves, *Frequency modulation, Radio receivers, Radio transmission, *Ionosphere, Attenuation, Experimental data, Tables.

Values of the product $G\nu$, ν_c (collision frequency) and α (mean coefficient of total absorption) for the carrier frequency of AFN Frankfurt (872 kc/s) have been calculated from the measures made and from the theoretical method applied. The value of ν_c is given as the order of magnitude 10^4 and α is included between 1,4000 and 2,0048 Neper. The method used to calculate $G\nu$, ν_c and α is explained. Some experimental observations on the study of fading are given. (Author) (See also PB 150 928)

RESEARCH METHODS, TECHNIQUES AND EQUIPMENT

PB 159 180 $6.60

Stanford Research Inst., Menlo Park, Calif.
DEVELOPMENT OF AN EARTH VELOCITY GAGE, by L. M. Swift. Final rept. on Contract DA 49-146-XZ-011. 31 Oct 60, 65p. 1 ref. SRI Proj. no. SU-2868: DASA-1191; AD-248 934.

DESCRIPTORS: *Nuclear explosions, Particles, *Gages, Earth, Velocity, Design, Motion, Measurement.

Because of the errors inherent in the integration of acceleration records to obtain particle velocity, there is a demand for gages which measure particle velocity directly, both vertically and horizontally. Such gages were developed, based on a special application of the overdamped accelerometer. The gages are designed to measure velocities at ranges from nuclear explosions where the particle velocity is from 1 to 60 ft/sec and where pulse durations are 10 msec or more. They are not intended for use on small HE tests or in other applications where conventional vibration pickups are satisfactory. The gages designed and built in some quantity have an upper limit of frequency response of about 200 cps, with a lower limit of about 0.1 cps for the horizontal gage and no lower limit for the vertical gage, although the latter is limited to about two sec recording time. Field tests to date are inconclusive, due to characteristics of the tests, but gage performance has apparently been satisfactory. (Author)

SOCIAL SCIENCES

PB 157 323 $12.00

Alaska U., College.
POINT HOPE, AN ESKIMO COMMUNITY IN NORTHWEST ALASKA, by James W. Vanstone. Mar 61, 169p. 35 refs. Technical rept. AAL TR 57-22.

DESCRIPTORS: *Eskimos, *Alaska, *Economic conditions, *Sociology, Anthropology, *Rural areas, Geography, History, Housing, Water supplies, Animals, Food, Preparation, Clothing, Labor, Vital statistics, Culture, Religion.

The problem was to determine current economic and social conditions in an Eskimo village located along the northwest coast of Alaska, chosen because of its size and relative stability of population over a long period of time, and because it is free from extreme outside influences in the form of military sites, CAA, construction projects, et cetera. Life at Point Hope is primarily oriented toward sea-mammal hunting and, in recent years, employment for wages has been satisfactorily fitted into the seasonal cycle during the summer months.

PB 156 792 $10.10

Armed Services Technical Information Agency, Arlington, Va.
CONTROLLING LITERATURE BY AUTOMATION. PRESENTED AT THE ANNUAL MILITARY LIBRARIANS' WORKSHOP [NO. 4] SPONSORED BY ARMED SERVICES TECHNICAL INFORMATION AGENCY, 5-7 OCTOBER 1960, WASHINGTON, D. C. [1960] 129p. 4 refs. AD-243 000.

DESCRIPTORS: *Data processing systems, *Documentation, Scientific reports, Automation, Literature

Contents:
Preparing for automation
Selection, training and relocation of personnel
File conversion, data cleanup and inventory control
Human aspects of ADPS
Building an information retrieval system
Impact of automation on the organization structure of ASTIA
The road ahead--integrated data processing
The tape typewriter plan
A generalized computer method for information retrieval.

MISCELLANEOUS

PB 181 070 $1.25, $10.00/year

Naval Research Lab., Washington, D. C.
REPORT OF NRL PROGRESS. Mar 62.

DESCRIPTORS: *Naval research, *Scientific research, Doppler radar, Aircraft, Radar targets, S-band, Dislocations, Medical research, Feedback, Control, Chemistry, Ethyl radicals, Amines, Electricity, Semiconductors, Mechanics, Glass textiles, Amines, Tungsten, Fuel injection, Metallurgy, Ceramic materials, Refractory materials, Diffusion, Silicon, Hall effect, Conductivity, Steel, Radiation effects, Iron alloys, Chromium alloys, Oxidation, Water vapor, Corrosion inhibition, Anodes, Underwater objects, Sodium compounds, Hydroxides, Lithium compounds, Nuclear physics, Neutron diffraction analysis, Automatic, Reactor control, Amplifiers, Betatrons, Optics, Surfaces Reflection, Navigational lights, Visibility, Radio, Transistory, Memory devices, Oscilloscopes, Satellite vehicles, Communication systems, Microwaves, Phase shifters, Frequency, Radar antennas, Antennas, Electrons, Electric insulation, Ethylenes, Fluorides, Polymers, Lead compounds, Tellurides, Crystals, Growth, Ferrites, Solid state physics, Phosphors, Spectrographic analysis, Coils, Patents, Scientific reports.

Contents:
Articles:
Doppler Spectra of Aircraft Radar Targets at S-Band, by R. E. Gardner
Motion of Charged Dislocations Detected by Current Flow, by F. W. Von Batchelder, J. W. Davisson, and W. H. Vaughan
Applications Research: Electronic instrumentation for medical research: alpha rythm feedback control
Chemistry: Collection of slick-forming materials from the sea.... Review of monoethanolamine chemistry
Electricity: Instrument for measuring the resistance of semiconductors that have a large Seebeck coefficient
Mechanics: Maximum strain in the resins of fiberglass composites.... Thermal shock in a flat tungsten slab... Materials compatibility study for Polaris fluid-injection guidance
Metallurgy and Ceramics: Study of diffusion in refractory metals.... In-pile measurements of conductivity and Hall coefficient of silicon.... Notch ductility of A302B steel irradiated at 540°F, 640°F, and 740°F... High-temperature oxidation process for iron-chromium alloys in water vapor.... Efficiency of aluminum-base anodes for the protection of steel underwater structures against corrosion.... Corrosion of steel in 40% sodium hydroxide solution at 316°C.... Corrosion products obtained on steel in lithium hydroxide at 600°F
Nuclear and Atomic Physics: Automatic, single-crystal, neutron diffractometer.... Transistorized magnet current amplifier for a reactor control system.... Five-foot diameter betatron with external injection
Optics: Some angular reflectance properties of light-trapping surfaces.... Visibility of navigational lights
Radio: Transistorized binary memory "oscilloscope"... Automatic plotting of NASA world book data on NRL's low-frequency communication research satellite (LOFTI I).... Continuous microwave phase shifter and frequency translator.... Phase-scanning techniques for fixed-array radar antennas.... Electron emission prior to electrical breakdown in vacuum halted by insulating cathode with thin film of Teflon.... Growth of lead telluride crystals for solid state electronic devices.... High-power characteristics of two ferrite geometries
Solid State Physics: Pressure dependence of the emission and absorption spectra of phosphors
Supporting Techniques: A Self-Supporting Coil for High-Temperature Applications.

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